

Drawn up for the Consideration of the *X. C.*
BOARD OF AGRICULTURE

J. BAILEY AND G. CULLEY.

"Happy Northumbria!
 "Grateful thy soil, and merciful thy clime,
 "Thy Streams unfailing in the summer's drought;
 "————— Thy vallis float
 "With golden waves; and, on thy mountains, flocks
 "Bleat numberless; while, roving round their sides,
 "Bellow the blackening herds in lusty droves."

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1797.

For: Banks

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PRELIMINARY OBSERVATIONS.

IN drawing up this Report, according to the plan laid down by the Board of Agriculture, we have endeavoured to be as concise as possible, except in those articles which are in a great measure peculiar to this district, some of which, we have reason to think, may be adopted with advantage in others.

It is scarcely possible, in an undertaking of this kind, to describe all the minutiae of practice, or to notice every local improvement; but we hope that the most prominent features of the Agriculture of Northumberland, as existing in 1795, will be found faithfully recorded in the following sheets.

As weights and measures vary in different districts, we think it right to apprise our readers that, in the following Reports of Northumberland and Cumberland,

An Acre is the statute Acre of 4840 square yards.

A Bushel = 8 gallons Winchester.

A Rood = 7 yards in length.

A Fother = a two horse cart-load of lime, dung, &c.

A Stone of Wool = 24lb. Avoirdupoise.

A Stone of every other article = 14lb. ditto.

In

In the Report of Westmoreland the customary acre is generally meant, which contains 6760 square yards, or 1 A. 1 R. 23½ P. statute measure.

It may also be proper to explain the following provincial terms :

A Hog { is a name given to young sheep, from 6 months old till they are shorn.

A Gimmer { an Ewe sheep, from the first to the second shearing.

A Dinmont { a Wether sheep, from the first to the second shearing.

A Quey—an Heifer.

A Steer—a three years old Ox.

Kyloes { a small breed of Cattle bred in the Highlands of Scotland.

Byer—a House for tying up Cattle in Winter.

Fog—aftermath.

Scaling—spreading abroad mole hills, dung, &c.

AGRICULTURAL SURVEY

OF

NORTHUMBERLAND.

CHAPTER I.

GEOGRAPHICAL STATE AND CIRCUMSTANCES.

SECTION I.—*Situation and Extent.*

THE district included in this Survey is the whole of the county of Northumberland, and those detached parts of the county of Durham called Norhamshire, Islandshire, and Bedlingtonshire.

IT IS BOUNDED

On the East, by the German ocean,	-	60 miles
West, { by Roxburghshire	-	50
{ and Cumberland,	-	47
North, by Berwickshire,	-	18
South, by the county of Durham,	-	50

Making the whole circumference - 225 miles.

It is situated between the latitude of 54 deg. 51 min. and 55 deg. 48 min. north; and longitudes of 1 deg. 00 min. and 2 deg. 27 min. west from London; its greatest length from north to south is 64 miles, and breadth 48; and contains 1980 square miles, which } Acres.
may be divided into lands that are, or } - 817200
may be, cultivated by the plough - }

And mountainous districts improper for tillage, 450000

Making in the whole, 1267200

B

SECT.

SECT. 2.—*Division.*

The county of Northumberland is divided into six Wards,—viz. Tindale Ward, Coquetdale Ward, Glendale Ward, Bamborough Ward, Morpeth Ward, and Castle Ward.—The three first are situated in the western part of the county, and include the whole of the mountainous district, with a considerable portion of inclosed cultivated country:—The three latter adjoin the sea coast, and being exempt from mountainous district, have been long under cultivation; the vast resources of coal, Castle Ward in particular possesses, and the increased population the coal trade occasions, give them a decided preference in point of riches and population; tho' in point of magnitude, considerably the smallest, occupying less than one-fourth of the county.

Norhamshire and *Islandshire* are situated at the northern extremity of the county of Northumberland, and comprehend a triangular space, the two sides of which are formed by the River Tweed and German Ocean, and the base the northern boundary of Glendale and Bambro' Ward; it contains about 72 square miles of well-inclosed cultivated country.

Bedlingtonshire is situated at the south-east corner of Castle Ward, bounded on the east by the German Ocean, and on the north and south by the rivers Wansbeck and Blyth, and contains about 30 square miles.

SECT. 3.—*Climate.*

The Climate—in regard to temperature, is subject to great variation; upon the mountains, snow will often continue for several months, (and may frequently be seen there of a considerable depth) when there is none in the lower districts. The weather is very inconstant, but mostly

ly runs in extremes. In the Spring months, the cold, piercing, easterly winds are most prevalent; and our longest droughts are always accompanied by them: in some places they have acquired the name of *sea-pines*, from the slow progress vegetation makes whenever they continue for a few weeks. Rain is of little use while they prevail, from the great cold which always attends them.

The mild western and southern breezes rarely take place before June; they are certain harbingers of rain and vigorous vegetation, and are the most prevailing winds through the Summer and Autumn: In the latter season, they often blow with tempestuous fury, dash out the corn, and disappoint the just hopes of the industrious farmer.

Our greatest falls of snow, or rain, are from the south, or south-east; and whenever we have a very high *west wind*, it is a certain sign that a great quantity of rain is falling to the westward, in Cumberland and Roxburghshire.

SECT. 4.—*Soil and Surface.*

A strong fertile clayey loam—occupies the level tract of country along the coast, and reaches as far up in general as the great post road. It is well adapted to the culture of wheat, pulse, clover, and grazing.

Sandy, gravelly, and dry loam—or what is here more generally understood by turnip soil, is found on the banks of the Tyne, from Newburn to Haltwhistle; on the Coquet, about and above Rothbury; on the Aln, from its mouth to Alnwick; and down Tweed-side: But the greatest quantity of this kind of soil is found in the vales of Breāmish, Till, and Beaumont. The hills surrounding the Cheviot mountains are mostly a dry, channelly, sharp-pointed, gravelly loam.

Moist Leams—on a wet, cold, clayey bottom, occupy a large portion of this county, being unsafe for sheep, and unfit for turnips; they are principally employed in growing grain, rearing young cattle, and feeding ewes and lambs. This soil prevails most in the middle and south-east parts of the county.

Black Peat Earth—is the prevailing soil in most of the mountainous districts, and is found in many places through the lower parts of the county.

The aspect of this county, in respect to surface, is marked with great variety; along the sea-coast, it is nearly level; towards the middle, the surface is more diversified, and thrown into large swelling ridges, formed by the principal rivers:—These parts are well inclosed; in some places enriched with wood and recent plantations, but the general appearance is destitute of those ornaments:—The western part (except a few intervening vales) is an extensive scene of open, mountainous district, where the hand of Cultivation is rarely to be traced.

Of the mountainous districts, those around Cheviot are the most valuable; being in general fine green hills, thrown (by some of those convulsive changes which this globe has at some time experienced) into numberless variety of forms; the verdant, swift-sloping sides of which, inclose and shelter many deep, narrow glens: through the whole of this district no mineral or other kind of stone is found, except brown, red, and grey whinstone:—they extend from the head of Coquet, down to Allenton; from thence northward to Prendwick, Branton, Ilderton, Wooler, Kirknewton, and Mindrim, and occupy at least an area of 90000 acres.

The other mountainous districts lie chiefly on the western part of the county, some of which adjoin the county of Durham; but the largest portion extends from the Roman Wall to the river Coquet (with a few intervening inclosed

inclosed vales) and to the moors north of Rothbury.—They are not marked by any striking irregularities of surface, being in general extensive, open, solitary wastes, growing little else but heath, and affording a hard subsistence to the flocks that depasture them.

SECT. 5 — *Minerals.*

Coal—is found in abundance thro' the greatest part of this county, particularly in the lower district; in the south-east quarter it is of the best quality,* and the most numerous and thickest seams, from whence those vast quantities are exported which supply the great consumption of the London market, as well as the coasting and foreign trade.—This coal trade is the foundation of the commerce of the county, and the principal source of its wealth, as well as a never-failing nursery for some of the best seamen in the British Navy.—Of the quantity of coals raised in this county, we have not been able to form a probable conjecture, for want of sufficient data to estimate the quantity used at home; but have obtained what are exported from the River Tyne, in which a considerable portion raised in the county of Durham is included, and which may probably come near a balance for those consumed in this county.—Some idea of the magnitude of this trade may be formed by the following statement of.

The Exports of Coals from Newcastle.

In 1772	351899	Newcastle chaldrons
1776	380000	
1791	444909	
1792	490682	

* The coals found in this district are of the variety called "*caking coals*," which melt in the fire, burn to a strong cinder in the open air, and the best kinds produce very few ashes.

1793	486133
1794	426384*
1795	505650

From hence it appears that this trade is increasing at an amazing rate, there being not less than one-third more coals exported now than were exported 20 years since: From Hartley and Blyth there are exported yearly between 30000 and 40000 chaldrons; if these be added to the average export from Newcastle for the last three or four years, the quantity exported from this county may be fairly estimated at 510000 Newcastle chaldrons, or 956250 London chaldrons; the Newcastle chaldron being to the London chaldron in the ratio of 8 to 15:—The value of the above quantity to the various parties concerned will appear by the following

Calculation of the cost and charges upon a ship-load of coals containing 20 keels,† or 160 Newcastle chaldrons, delivered in the port of London.

<i>Paid at Newcastle,</i>	£.	s.	d.
To the coal owner (fittage included‡)			
for 160 chaldrons, at 15s. per chald.	120	0	0

* This is the only year in which we find the quantities raised in Northumberland and Durham are kept distinct, and which are in the county of Northumberland, - 257462 chaldrons in Durham, - - - 168922

In all 426384

† A keel of coals is 21 ton 4 cwt. and contains 8 Newcastle chaldrons, so that each chaldron is 33 cwt.—A London chaldron contains 36 heaped Winchester bushels, and weighs on an average near 28½ cwt. (according to the quality of the coals) which weights being nearly in the ratio of 8 to 15, it is always reckoned, that 8 Newcastle chaldrons make 15 London chaldrons.

‡ The price paid for coals at Newcastle varies from 13s. to 17s. 6d. per chald. according to the goodness; but in the above calculation the average is taken at 15s. out of which the coal-fitters deduct for fitters fees; for all above Bladon Burn mouth 1s. 5½d.—Lemington 1s. 4½d.—Denton 1s. 4d. and all under Denton 1s. 3½d. per Newcastle chald.—So that the coal owner for a chald. of Denton coals (provided the price be 15s.) receives only 13s. 8d.

Brought

OF NORTHUMBERLAND.

7

	£.	s.	d.
Brought forward	120	0	0
20 keel dues at 13s. 4d. - - -	13	6	8
Trimming 2s. 6d. keelman's beer 1s. 4d. per chaldron - - -	3	16	8
Duke of Richmond's duty 1s. per chald. and ticket 6d. - - -	8	0	6
Cocket and bond at Custom-house - -	0	3	8
Town's dues 2d.* per chaldron and 1s. for ticket - - -	1	7	8
Fee (or 'Foy') to fitter's clerk - -	0	5	0
Insurance (suppose) - - -	1	10	0
Bridlington Pier - - -	0	4	6
Spurn Light - - -	0	13	4
Well, Winterton, Foulness, Caster, Lo- westoff, and Harwich lights; and Scarborough and Whitby Piers }	4	13	5

Paid at London—

Entry fee at Meter's office - - -	0	3	6
Cocket fee 2s. 6d. return 1s. 6d. - -	0	4	0
Lord Mayor's dues a farthing per London chaldron - - -	0	6	0
Ditto for groundage - - -	0	0	6
Trinity House dues 3 farthings per New- castle chaldron - - -	0	10	0
Nore light 3s. market dues 3s. - -	0	6	0
Carried over	155	11	5

* The Corporation of Newcastle formerly charged 3d. per chaldron for town's dues, which they had continued to do for a long series of years; but in 1794 Wm Leighton, Esq; of London, brought an action against them for over-charge of dues, and on its being tried at York assizes, a verdict was given for Mr Leighton, by which the dues were reduced to ad. per chaldron.

	£.	s.	d.
Brought over	155	11	5
King's duty* 8s. 10d. { 10s. per London			
Mettage 0 8 { chald. on 300†			
Orphan's duty 6 { chaldrons	150	0	0
King's duty on Meter's sack	0	1	6
Bond	0	13	6
Discount 2 per cent. on two-thirds of the amount (supposing the coals to sell for 35† pounds per score of 21 chaldrons to the score; the amount of the cargo will be 500 pounds) which with some other expences will be about	7	16	0
Commiffion $\frac{1}{2}$ per cent on the whole a- mount	2	10	0

Total expences of the cargo 316 12 5

Which deducted from 500l. (the amount of the cargo
as above) leaves 183l. 7s. 7d. for the freight of the ship.

As

* The duties on coals in the port of London, are—

	£.	s.	d.
By 8th Ann ch. 4	0	3	0
9 do. ch. 6	0	2	0
9 do. ch. 22, to build churches	0	3	0
Impost in 1779 of 5 per cent	0	0	$4\frac{2}{3}$
Ditto in 1782 of 5 per cent	0	0	$4\frac{2}{3}$
added to raise the fraction to an integer	0	0	$0\frac{2}{3}$

Total 0 8 10

Duties on coals carried coastways into the out ports, are—

	£.	s.	d.
By 8th Ann ch. 4	0	3	0
9 do. ch. 6	0	2	0
Import in 1779 of 5 per cent	0	0	3
Ditto in 1782 of 5 per cent	0	0	3
	0	5	6

† 160 Newcastle chaldrons are equal to 300 London chaldrons
—viz. as 8 : 15 :: 160 : 300.

‡ The price of coals at London is very fluctuating; but we
have

As we are not able to procure sufficient information of the number of people in the coal trade, we shall take the liberty of extracting from Mr M^r Nab's Letter to Mr Pitt, that the number of persons employed and dependent on the coal trade, in the year 1792, were,

On the river Tyne - 38475

On the river Wear - 26250

Total 64725

To the coal-owners the winning and working these collieries are very expensive, and frequently attended with considerable risque; for tho' very large fortunes have been made in the business, yet many have been lost; the unexpected alteration of the strata, from dykes and other troubles; the frequent and dreadful explosions from inflammable air; the great depth of the shafts, and increasing quantities of water to be raised from them, baffle the most experienced artists, and overcome the amazing powers of the fire-engine, which of late years has received many improvements, and been made to perform what was thought absolutely impossible at its first introduction.*

These powerful machines are now applied to the purposes of drawing coals, which business was formerly universally performed by horses; frequently 8 to a shaft, where great quantities were drawn and dispatch was necessary; but by the invention and application of the drawing machines, a great many horses were dismissed from

have taken it at 35s. per chaldron, as the average price for good coals, when there is no interruption to the trade and navigation; but in March, 1795, coals sold in London at the amazing price of 70s. per London chaldron, on account of the scarcity occasioned by the long frost.

* We were informed that there was only one fire-engine in the neighbourhood of Newcastle, about 50 years since,—that it raised the water only 40 yards, which, at that time, was thought a wonderful performance; at present water is raised, and probably in greater abundance, 160 yards, and upwards.

the

the collieries; which has considerably reduced the consumption of oats in this neighbourhood.

Many of the collieries are situated at a considerable distance from the river, to which the coals are conveyed from the pits in a peculiar kind of carriage, called a *Newcastle coalwaggon*; (pl. I, fig. I.) it has 4 small wheels, about 34 inches diameter, *fixed to the axles*, with which they turn round, and move on a road (called the waggon-way) made on purpose *with wood*, which is formed by long pieces of wood (RA, rails) about 4 inches square, laid length-ways, upon sleepers of wood (SSS) and the thickness of the rail above the plane of the rest of the road, and at the exact distance of the waggon wheels from each other, as it is upon those rails the wheels run.

A new waggon-way (including timber, levelling, graveling, and workmanship) will cost about 5s. per yard, or 440l. per mile; and the expence of keeping it in repair is generally about 1½d. per chaldron on a quantity of 15000 chaldrons annually, or 93l. 15s. od. per mile.*

The dimensions of the body of these waggons are as follows:

			Fr.	Ins.
Length at top	-	-	7	0
———— bottom	-	-	5	6
Breadth at top	-	-	6	0
———— bottom	-	-	3	0
Height	-	-	3	9

They hold a chaldron of coals, or 53 cwt. and are drawn by a single horse.

* It has been suggested, that a waggon-way might be substituted in lieu of turnpike roads, for the conveyance of heavy goods; but we presume, that the expence of first making, laying out in nearly a level line, or so as to have little or no ascent, and keeping in repair, would greatly overbalance the additional weight to be drawn by one horse; as the wood rots and wastes nearly as much by a small quantity of carriage passing along it, as a large.

A gently-inclined plane is the most desirable position for those waggon-ways; but few situations will admit of this: Upon levels, or easy ascents, a single horse draws the waggon: On such parts of the way where the declination is sufficient for the waggon to move by the power of gravity, the horse is taken out and follows behind; and where the descents are such, that the waggon would move with too great rapidity by its own weight, (or "*run a-main*,"*) the motion is regulated by a crooked piece of wood, (called a *convey*) coming over the top of one of the hind wheels; upon which the waggon-man presses with such force as he finds requisite, to regulate the motion of the waggon.*

It has been asserted, that "*the coals in this county are inexhaustible*."—Mr Williams, in his Natural History of the Mineral Kingdom, is of a different opinion, and thinks it a matter of such importance as to deserve the serious attention of the Legislature.—Towards elucidating this point, it may be of some use to estimate what number of acres are wrought yearly in this county to supply the above quantity of coals: In order to accomplish this object, the thickness and number of workable seams of coal must be first ascertained; for which purpose we have been favoured with sections † exhibiting the thickness and depth of the various strata, in some of the deepest pits in the county; which will not only be useful for the present purpose, but we hope will be acceptable to many of our readers, who are curious in researches of subterraneous geography.

At St Anthon's Colliery (3 miles east of Newcastle) the strata from the surface to the Low MAIN coal, are:—

* This mode of conveyance has been used here upwards of 120 years.

† One of St Anthon's, about 3 miles below Newcastle, by Mr Johnson; the other of Montague Main, about 3 miles above Newcastle, by Mr Thomas.

Soil

					Yds.	Ft.	Ins.
	Soil and clay	-	-	-	10	0	0
	Brown post	-	-	-	24	0	0
1.	COAL	-	-	-	0	0	6
	Blue-metal stone	-	-	-	5	2	0
	White girdles	-	-	-	4	1	0
2.	COAL	-	-	-	0	0	8
	White and grey post	-	-	-	12	0	0
	Soft blue metal	-	-	-	10	0	0
3.	COAL	-	-	-	0	0	6
	White post girdles	-	-	-	6	0	0
	Whin	-	-	-	3	1	6
	Strong white post	-	-	-	6	1	0
4.	COAL	-	-	-	0	1	0
	Soft blue thill	-	-	-	3	2	0
	Soft girdles mixed with whin	-	-	-	7	2	0
5.	COAL	-	-	-	0	0	6
	Blue and black stone	-	-	-	7	1	0
6.	COAL	-	-	-	0	0	8
	Strong white post	-	-	-	3	0	0
	Grey metal stone	-	-	-	3	1	0
7.	COAL	-	-	-	0	0	8
	Grey post mixed with whin	-	-	-	8	1	0
	Grey girdles	-	-	-	6	1	0
	Blue and black stone	-	-	-	4	2	0
8.	COAL	-	-	-	0	1	0
	Grey metal stone	-	-	-	4	0	0
	Strong white post	-	-	-	12	0	0
	Black metal stone with hard girdles	-	-	-	6	0	0
9.	HIGH MAIN COAL	-	-	-	2	0	0
	Grey metal	-	-	-	9	0	0
	Post girdles	-	-	-	0	2	0
	Blue metal	-	-	-	1	1	0

Carried over 163 0 2

Girdles

					Yds.	Ft.	Ins.
				Brought over	163	0	2
	Girdles	-	-	-	0	1	2
	Blue metal stone	-	-	-	10	0	0
	Post	-	-	-	0	1	0
	Blue metal stone	-	-	-	6	0	0
	Whin and blue metal	-	-	-	0	1	6
	Strong white post	-	-	-	7	0	0
	Brown post with water	-	-	-	0	0	7
	Blue metal stone with grey girdles	-	-	-	4	2	0
10.	COAL	-	-	-	1	0	0
	Blue metal stone	-	-	-	6	0	3
	White post	-	-	-	1	1	0
11.	COAL	-	-	-	0	0	6
	Strong grey metal with post girdles	-	-	-	4	0	6
	Strong white post	-	-	-	2	1	0
	Whin	-	-	-	0	1	0
	Blue metal stone	-	-	-	2	2	7
	Grey metal stone with post girdles	-	-	-	5	1	5
	Blue metal stone with whin girdles	-	-	-	3	1	3
12.	COAL	-	-	-	0	1	6
	Blue grey metal	-	-	-	1	0	8
	White post	-	-	-	4	0	7
	White post mixed with whin	-	-	-	4	0	0
	White post	-	-	-	2	2	0
	Dark blue metal and coal	-	-	-	0	2	2
	Grey metal stone and girdles	-	-	-	4	2	0
	White post mixed with whin	-	-	-	6	0	7
	Whin	-	-	-	0	1	0
	White post mixed with whin	-	-	-	2	0	6
13.	COAL	-	-	-	1	0	3
	Dark grey metal stone	-	-	-	1	0	6
	Grey metal and whin girdles	-	-	-	3	1	10

Carried over 251 2 6

Grey

			Yds.	Ft.	Ins.
	Brought over		251	2	6
	Grey metal and girdles	-	3	0	0
	White post	-	1	0	0
14. COAL	-	-	1	0	2
	Blue and grey metal	-	1	1	0
15. COAL	-	-	0	0	9
	Blue and grey metal	-	4	0	0
	White post mixed with whin	-	1	1	6
	Grey metal	-	2	0	6
	Grey metal and girdles	-	2	0	9
16. LOW MAIN COAL	-	-	2	0	6
Total			270	1	8

In the above pit or shaft, which is nearly* the deepest in the kingdom, there are no less than 16 seams of coal. But many of these, from their thinness, are not workable. The 9th, called the *high main coal*, and the 10th, the *low main coal*, are the two principal seams for affording quantities of coal, being together $12\frac{1}{2}$ feet thick, and are those most generally wrought. But the 10th, 13th, and 14th, are all workable seams, and will afford considerable quantities of coal; the aggregate of the three making nearly $9\frac{1}{4}$ feet thick; so that the total thickness of the workable seams in this colliery amount to 22 feet.

In Montague Main Colliery (3 miles west of Newcastle) south of the main dyke, the strata are:—

			Yds.	Ft.	Ins.
	Soil and clay	-	5	0	0
	White post	-	0	2	0
1. COAL (1)	-	-	0	0	4
	Black metal stone	-	1	0	2
	Grey post	-	3	2	0
Carried over			10	1	6

* A pit has lately been sunk at Willington, 5 miles north-east from Newcastle, which is 280 yards deep, to the low main coal.
Blue

				Yds.	Ft.	Ins.
Brought over				10	1	6
Blue metal stone	-	-		5	1	0
Grey post	-	-		4	0	0
Strong white post	-	-		5	0	0
Grey post	-	-		1	2	0
White post with black metal partings				10	0	0
Grey post	-	-		0	1	4
Brown post with coal pipes				1	1	8
White post	-	-		5	0	0
Ditto with whin	-	-		1	0	0
2. COAL (2)	-	-		0	0	6
Black metal stone	-	-		9	0	0
Grey ditto	-	-		8	2	0
Brown post with skamy partings				1	1	0
3. COAL (3)	-	-		0	0	9
Grey metal stone	-	-		3	2	10
Ft. Ins.						
4. { COAL 1 0 } { BAND 0 9 } { COAL 3 6 }	Benwell Main			1	2	3
Grey metal stone	-	-		1	1	0
Strong white post	-	-		5	1	0
Whin	-	-		0	2	0
White post	-	-		2	2	0
5. COAL	-	-		0	1	0
Black metal stone	-	-		3	0	8
White post	-	-		6	0	0
Black metal stone	-	-		9	0	0
Grey metal stone	-	-		10	2	4
Grey post with whin girdles	-	-		5	0	0
Strong white post	-	-		12	2	0
Grey metal stone	-	-		6	2	0
6. COAL	-	-		0	0	8
Carried over				133	1	6

Post

		Yds. Ft. Ins.		
Brought over		133	1	6
Post girdles	- - -	0	2	0
Grey metal stone	- - -	2	1	0
7. COAL, called <i>Beaumont Seam</i>	- - -	1	0	4
Strong white thill	- - -	1	0	7
Strong white post	- - -	4	0	4
8. COAL	- - -	0	1	6
Black thill	- - -	0	2	4
Grey metal stone	- - -	0	1	2
Grey post	- - -	0	2	0
Grey metal stone	- - -	0	2	10
Strong white post	- - -	1	0	4
9. COAL	- - -	0	1	3
Black metal stone	- - -	2	2	4
White post	- - -	0	1	8
Blue metal stone with post girdles	- - -	2	0	0
White post with whin girdles	- - -	4	1	9
Black metal stone	- - -	0	1	5
Grey post	- - -	0	1	2
Blue metal stone	- - -	1	0	0
Strong white post	- - -	0	1	3
Blue metal stone	- - -	2	2	1
10. COAL	- - -	0	0	8
Black thill	- - -	1	0	4
Blue metal stone with post girdles	- - -	2	1	0
Grey post	- - -	1	0	0
Strong white post	- - -	7	2	6
Black metal stone	- - -	0	0	1
11. COAL, called <i>Low Main</i>	- - -	0	2	11
Grey metal stone	- - -	9	0	0
White post	- - -	5	0	0
Grey metal stone with post girdles	- - -	2	0	0
White post with whin girdles	- - -	6	1	6
Carried over		198	1	10

Grey

		Yds.	Ft.	Ins.
	Brought over	198	1	10
	Grey metal stone with post girdles	1	1	0
12.	COAL called Low <i>Low Main</i> , or Baker's Main	0	2	10
	Grey metal stone	1	2	0
	White post	0	2	0
	Grey metal stone	0	1	8
	Black metal stone	0	0	10
	Grey metal stone	2	2	6
	Grey post	2	0	6
	Strong white post with whin girdles	7	1	8
	Grey metal stone	6	2	6
	Grey post	0	2	0
	White post	1	2	0
	Grey metal stone	0	1	0
13.	COAL	0	0	6
	Grey metal stone	0	1	0
	Grey metal stone with post girdles	6	2	2
14.	COAL	0	0	5
	Grey metal stone	0	0	4
	Grey post	2	1	6
	White post with whin	5	0	4
	Grey metal stone	0	1	0
15.	COAL	0	0	3
	Grey metal stone with post girdles	2	0	6
	Strong white post with whin girdles	1	2	5
Total depth		245	1	9

In this shaft there are 15 seams of coal, of which only four are workable, viz. the 4th, 7th, 11th, and 12th, making together 4yds. 1 ft. 7 ins. of workable coal. If the medium be taken betwixt this and St Anthon's, it will be nearly 6 yards thick of workable coal, from which may be formed

A calculation of the quantity of coal in an acre of ground, supposing the aggregate thickness of the various seams amount to 6 yards.

An acre of ground contains - 4840 square yards,
 which multiplied by the thickness, 6 yards,
 gives - - - - - 29040 cubic yards
 in an acre.

From which deduct $\frac{1}{3}$ for waste,
 and the part or pillars necessary } 9680
 to be left in working - }

there remains - - - 19360 cubic yards
 to be wrought.

And as three cubic yards of coal, when wrought, afford a Newcastle chaldron,

therefore $\frac{19360}{3} =$ gives 6453 Newcastle chaldrons per
 divided by 3 acre.

The coals exported yearly from the rivers Tyne and Wear, with Hartley and Blyth, amount to about 825000 chaldrons,* which, with the home consumption of the two counties of Northumberland and Durham, will make the quantity of coals raised yearly about 1,000,000 chaldrons.

And the chaldrons raised yearly $\frac{1,000,000}{6453} =$ gives 155
 divided by the chaldrons per acre } acres near-
 ly per year,
 cleared of
 coal 6 yds.
 thick.

And by estimating the breadth occupied by the caking coals to be on an average 8 miles broad, and 25 miles long, in the two counties, we shall find there will be about 200 square miles, or 128000 acres, of coal proper for exportation.

* From Newcastle,	310000 chaldrons.
— Sunderland,	315000 ditto.
In all	<u>625000</u>

Then

Then the whole area	128000 = 825 years.	The time
divided by the yearly } consumption,	155	{ before this space will be wrought out.

But there are some reasons to think, that a thickness of seam equal to 6 yards will not be obtained over an extent of 200 square miles; probably not more on an average than 4 yards; in which case, the coal will be exhausted in 550 years: and if the aggregate thickness of the seams to be obtained should prove only three yards, then little more than 400 years will be the term of continuance; but it is probable, that before the half of that time be elapsed, the price to the consumer will be considerably increased, from the increased expence of obtaining them, and the increased length of carriage from the pits to the river. This last, we presume, may be reduced in some situations, by adopting canals instead of waggon-ways, which we have often wondered have never yet been attempted.

From the above investigation it appears, that Mr Williams's apprehensions are not so chimerical as have been represented; how far it may be right for the legislature to interfere, we leave to the consideration of those more conversant in political speculations.

Of the coal found all thro' Bambro' Ward, Islandshire, and those parts of Glendale Ward east of the river Till, the seams are very thin, mostly from 1 to 3 feet thick, and of a very inferior quality, yielding a great quantity of ashes, and neither caking in the fire, nor burning to a cinder: they are used only for home-consumption, and for burning lime; for the latter purpose they are well adapted, by their property of neither caking nor burning to a cinder; and it luckily happens, that thro' all this district, the coal and lime are generally found together; a circumstance which greatly facilitates and lessens the expence of burning lime.

If a line be drawn from Alemouth to a little west of Bywell on the river Tyne, very little of this kind of coal and limestone will be found to the east of it; and from this line to the sea coast, no limestone whatever appears, except a small patch of a different limestone that puts in at Whitley, near Tynemouth, and runs from thence in a south-westerly direction thro' the county of Durham, &c. In this space, betwixt these two ranges of limestone, lie the caking coals of superior quality above described, and the same breadth of coal may be traced thro' the county of Durham, stretching in the same direction, and bounded on the east and west, in a similar manner, by stretches of limestone of different kinds.

It would be a curious investigation to trace these minerals thro' the different counties across the island, and show where the strata of each species rise to the surface; and the deviations caused in them by cross veins or dykes, &c.; we believe it will be found that very little or no coal lies to the east of this line, and that no chalk lies to the west.

Limestone,—of an excellent quality, abounds thro' all Bambro' Ward, Islandshire, and that part of Glendale Ward situated on the east side of the river Till; it stretches from hence in a south-westerly direction thro' the central parts of the county, and is found at Shilbottle, Longframlington, Hartburn, Rial, Corbridge, &c. and at numberless other places to the westward of these; but the south-east quarter, which is so rich in coal, is destitute of lime;* as is also that part of Glendale Ward west of the river Till.

Stone Marl,—abounds in many places near Tweedside; and *Shell Marl* is found in a few places in Glendale Ward. The greatest quantity is at *Wark* and *Sunnyslaw*, where it has been formed by a deposit of various kinds of

* Except a small patch at Whitley, near Tynemouth.

shells,

shells, both univalve and bivalve, many of which are yet perfect, forming a stratum several feet in depth of pure calcareous earth; but the exact depth of this bed of marl has never yet been ascertained, for want of a proper level to carry off the water: It probably may afford matter of speculation to some readers to be informed, that in the middle of this marl there is an horizontal stratum of sand about 12 inches thick; and also that, a few years since, a *Red Deer Stag*, in the attitude of running, and in every part complete, was found embedded in the marl: horns of the same animal have been found at different times in perfect preservation; and a part of the *scalp*, with the *cores* of a pair of horns belonging to some animal of the *Bos Taurus* species, were lately found here: we have never seen any breed of cattle, the horns of which were of equal magnitude; for though the outside shell or horn part was wanting, yet the *core* was 24 inches long, and 12 inches circumference at the root; and when in a perfect state and covered with the outside shell, must have been about 5 inches diameter: their form is a gentle curve, and have all the appearance of a pair of bull's horns; but probably of a different breed of cattle to any we have at present.

Clay Marl,—is also found in small quantities, but in situations where it could not be conveniently used with effect.

Lead Ore,—has hitherto never been found in any quantity but in the mountainous districts on the south-west part of the county, towards the head of that branch of South Tyne, called Allendale; and a small quantity at Fallowfield, a little to the north of Hexham.*

In this county, lead ore is wrought by the *bing*, a measure containing 8 cwt. of clean ore; the workmen being paid by the owners of the mine at different prices,

* The lead mines in Allendale produce about 12000 bings of lead ore annually, which at 4l. 4s. 6d. per bing, is upwards of 50000l. a year.

from 8s. to 36s. per *bing* (for getting, and washing, or cleaning) according to the richness, quality, or hardness of the mine. If the owners sell any of the ore in this state, the price is generally from 3l. 10s. to 4l. 10s. per *bing*, but they mostly have smelt-mills of their own, where they smelt it at their own cost, take the silver out of it by refining,* and then cast the lead into long pieces, called *pigs* of $1\frac{1}{2}$ cwt. each.—*Pig lead* is sold by the fother, a quantity containing 21 cwt. which is reckoned to sell at a fair price when at 15l. or 16l. per fother; in 1776 it was as low as 12l. and in the beginning of 1782 it was 17l. 5s.—in 1788 it rose gradually to 23l. 10s. per fother, which was several pounds higher than it was ever sold at before; but in the following year, it fell to 16l. or 17l. per fother, which shews the fluctuating price of this article.

The *Ore of Zink*,—is found in great abundance embedded with spar, in most of the veins producing lead ore; but its distance from any brass manufactures, and from water carriage, renders it of little value. In these mines are also found great variety of crystallizations of spar, quartz, &c. &c.

The mines which produce lead ore are very fluctuating, and uncertain in point of profit to the adventurers; but tend to a general good, by giving employment to a numerous class of industrious workmen, who, being situated in a climate improper for the production of grain, are obliged to receive the greatest part of their provisions from the more fertile districts of the county, and by those means encourage its agriculture.

* The Alendale lead ore is smelted and refined at Dukesfield smelt-mill, and produces about 7 or 8 ounces of silver from each fother of lead; what is got at Fallowfield contains so little silver, that it will not pay the expence of refining; while some ore got in Alton Moor, in Cumberland, yields 42 oz. of silver per fother.

The process of refining greatly improves the lead, by making it more ductile.

Iron

Iron Ore,—may be had in many parts of the county; of late years the convenience of shipping it at Holy Island, has induced the Carron Company to have considerable quantities from thence.

Freestones,—of various kinds, abound in almost every part of the county, and are applied to all the purposes of building. Many of the quarries afford tolerable slates for roofing, and flags for floors: at some of them excellent grindstones are got, of which a great many are exported from Camus and Warkworth.

SECT. 6.—*Waters.*

The principal rivers, which act as estuaries to the rest, are the Tyne, Blyth, Wansbeck, Coquet, Aln, and Tweed. The innumerable streams, which lose their names in the above, spread in every direction through the county:—The Tyne branches into nearly two equal streams a little above Hexham, which are distinguished by the names of North Tyne and South Tyne: the main branch of North Tyne, is the Reed; and of South Tyne, the Allen: The principal streams which empty themselves into the Tyne east of Hexham, are the Devil's-water and the Derwent: and the river Till is the only stream, of any note, which empties itself into the Tweed, in this county.

The Tyne and Tweed are the most eminent for their navigation, the tide flowing up the former 16 miles, and up the latter eight or ten; the navigation of the other rivers is confined to a small distance from their mouths; of these the Blyth and Aln are of the most importance, from the convenience which the first affords to its neighbourhood, for the exportation of considerable quantities of coals; and both of them for corn, &c. and the importation of timber, iron, and other useful articles.

The Tyne and Tweed have been long celebrated for
C 4 their

their salmon fisheries: in the latter a rent of 800*l.* a year is paid for a fishing of 200 yards in length, near the mouth of the river; and the same rent is paid for other two fishings above the bridge, not more than 250 yards in length each. The fish taken here are, the Salmon, Bull-trout, Whiting, and large common Trout, and nearly the whole of them sent to London; in the conveyance of which, a great improvement has taken place of late years, by packing them in pounded ice; by this means they are presented nearly as fresh at the London market, as when taken out of the river. For the purpose of carrying them, and keeping up a constant and regular supply, vessels called smacks sail 3 times a week, and being purposely constructed for swift sailing, frequently make their run in 48 hours. These vessels are from 70 to 120 tons burden; on an average 12 men are employed in each vessel, and make about 14 voyages in a year; and not less than 75 boats, and 300 fishermen, are employed in taking the fish in the river Tweed.

CHAPTER II.

STATE OF PROPERTY.

SECT. 1.—*Estates.*

ESTATES vary in their annual value from 20*l.* to upwards of 20000*l.* a year;—one in particular is upwards of 40000*l.*—Small estates from 20*l.* to 200*l.* a year, are found in the southern and middle parts of the county, but very rarely in the northern.

There are probably few parts of the kingdom where estates have made such rapid improvements as in this county; there being several instances of the value being
more

more than trebled within the last 40 years. Many causes have certainly been aiding to produce this great effect; but the principal one is attributed to letting large farms, and leases for 21 years; by which means the tenants of capital were encouraged to make those great exertions, from which such advantages have resulted, not only to themselves and proprietors of the land, but to the community at large, from the very increased produce, and superiority of its quality.

The usual mode of letting farms is to fix a rent, under certain conditions and covenants, 6 or 12 months before the expiration of the lease; but upon one of the largest estates in the county,* the tenants have an offer of their farms $2\frac{1}{2}$ or 3 years before the expiration of the lease, which is a mutual benefit to both landlord and tenant; and is attended with so many advantages, that it is in a fair way of being generally adopted.

On some estates the practice of letting farms by *secret proposals* is still in use: this is a dark and mysterious mode, which frequently defeats the end it is intended to accomplish, and instead of obtaining an *excessive high rent*, the prize has been often gained at a *very inferior value*; and, in the language of the turf, (where only one has entered the lists) "by walking the course:" and we have known some of the first farmers in the county forego their farms, rather than submit to contend in the dark. Upon most estates it is generally stipulated, that a certain portion of the best old grazing lands, on each farm, shall be kept in grass during the whole term.

The quantity of land to be in ploughing is mostly limited to a certain number of acres; and at the expiration of the term, where the tenant quits on the 12th of May, he is allowed to have a crop of corn from off two-thirds of the arable lands; this is called the *way-going crop*: the

* The Earl of Tankerville's.

entering tenant has the straw, and leads the crop into the stack-yard.—The houses, hedges, gates, drains, &c. are kept and left in repair by the tenant, who likewise pays all taxes, cesses, &c.

Of the annual value of the estates in this county, no authentic information could be obtained; but a probable guess may be formed by supposing that there are 800000 acres of cultivated land, and that this on an average is worth 14s. per acre,—and that 450,000 acres of mountainous district is worth 2s. per acre.

Then 800000 acres, at 14s. - - 60000l.

And 450000 acres, at 2s. - - 45000l.

Gives the total value of the lands per ann. £.605000

SECT. 2.—*Tenures.*

The land property in this county is mostly freehold:—There are to be found in a few places some small parcels of copyhold; and in those districts which belong to the county of Durham, some leaseholds for lives, or years, held under the church.—There are also two or three manors of customary tenure towards the head of South Tyne.

CHAPTER III.

BUILDINGS.

SECT. 1.—*Houses of Proprietors.*

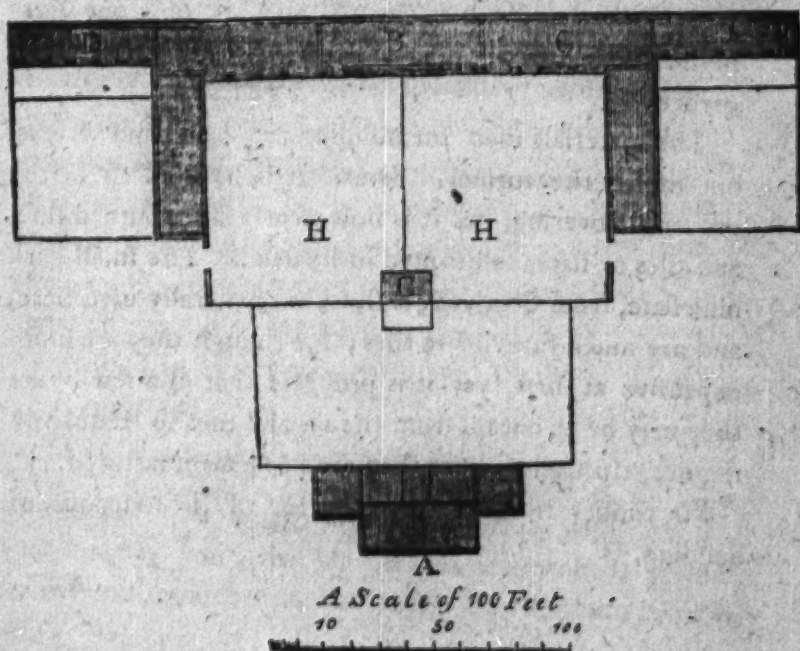
THE seats of the principal proprietors of this county consist of venerable castles, old halls, and elegant modern mansions.—To give particular descriptions would
be

be too extensive for an Agricultural Survey; those who wish for information on this subject, we beg leave to refer to Hutchinson's View of Northumberland, Pennant's Tour, &c. &c.

SECT. 2.—*Farm Houses, Offices, &c.*

Buildings,—for the use and convenience of farms, were formerly very shabby and ill contrived; but those that have been erected of late years, are better adapted to the various purposes wanted for extensive farms and improved cultivation.

The most approved form of distributing the various offices is, on the east, west, and north sides of a rectangular parallelogram, which is generally divided into two fold-yards, for cattle of different ages, the south being left open to admit the sun; and for the same reason, and also for the sake of cleanliness and health, the farm house is removed in front thirty or forty yards; between which and the south wall of the fold is a small court for coals, young poultry, &c. as in the annexed plan



- A. The farm-house.
- B. The barn, 18 feet by 60.
- C. Sheds, over which are granaries.
- D D. Ditto, upon which are built corn-stacks; one of which is for wintering yearling calves, the other for holding implements of husbandry.
- E. Byers for cows and work-oxen, 16 feet by 48.
- F. Stables.
- G. Pig-styes, with hen-house above.
- H H. Fold-yards for cattle of different ages.

Repairs are mostly done by the tenants; on the large farms complaints are seldom made of their being neglected, but upon small farms the landlord is frequently obliged to lend his assistance.

SECT. 3.—*Cottages.*

Such cottages as have been erected a number of years, are built with stone and clay, and covered with thatch; those that have been built of late years, are of stone and lime, covered with tiles, and mostly a floor of lime and sand; they consist of one apartment 15 ft. by 16, to dwell in, with a small one at the entrance for a cow, coals, working tools, &c. 9 ft. by 16, and are only one story high: Very few of them want the accommodation of a garden.

The materials used for building are, stone and bricks, but mostly the former. Straw (thatch) used to be the universal covering, but it is now nearly fallen into disuse, and tiles or slates substituted in its stead. The small dark blue slate, from Scotland, is the kind generally used here, and are much superior to tiles; for though they are more expensive at first, yet it is probable that in a few years they may be as cheap, from the repairs tiles so frequently require, especially where they are so ill manufactured.

Fir timber is universally used for all the purposes of building.

CHAPTER IV.

MODE OF OCCUPATION.

SECT. I.—*Farms, and Character of the Farmers.*

THE *size of farms*—varies considerably in this county; in Glendale and Bambrough Wards the farms are large, from 500l. to 1500l. a year; very few under 100l. In the other parts of the county they are from 50l. to 300l. a year: Some tenants in the northern parts of the county, farm from 2000l. to 4000l. a year, and upwards:—The capitals necessary for such farms entitle them to a good education, and give them a spirit of independence and enterprize, that is rarely found amongst the occupiers of small farms and short leases. Their minds being open to conviction, they are ready to try new experiments, and adopt every beneficial improvement, that can be learnt in other districts; for this purpose many of them have traversed the most distant parts of the kingdom to obtain agricultural knowledge, and have transplanted every practice they thought superior to those they were acquainted with, or that could be advantageously pursued in their own situation: And scarce a year passes without some of them making extensive agricultural tours, for the sole purpose of examining the modes of culture, of purchasing or hiring the most improved breeds of stock, and seeing the operations of new-invented and most useful implements.

The character of a farmer is here so respectable, that gentlemen who possess landed property from 500l. to 1500l. a year, think it no debasement to follow the profession:

feffion : and fo high a name have many of the farmers obtained for their fuperior knowledge in rural affairs, that they are feldom without pupils from various and diftant parts of the kingdom, with whom they have very handfome premiums.*—Amongft the prefent pupils may be reckoned the fon of an Earl and the fon of a Baronet ;—who, from their abilities, attention, and anxious readinefs to learn and work at every operation, we hope will do credit to the profeflion, and render the moft effential fervices to their refpective diftricts.

SECT. 3.—*Rent.*

The rent—of lands in this county ufed formerly to be clogged with payments in kind, and perfonal fervices : But thefe have been long difufed, and the whole is now paid in money.—The rents are moftly due on the 12th of May and the 22d of November ; but payment is feldom required till four or five months after being due.

The rent per acre muft vary with the quality of the land, and other circumftances : At a diftance from towns, and for the purpofes of farming only, lands may be had from one fhilling per acre up to 30 and 40 fhillings :—Laft year, a farm of upwards of 2000 acres was let for 20s. an acre, unincloded, but tithe-free of grain :—One of 600 acres, at 24s. per acre, pays all tithes :—Another of 300 acres, at 35s. per acre, tithe-free, well incloded, and in high condition, and feveral other large farms that pay tithes of every kind, have been let as high as from 27 to 37s. per acre ; and fome old rich grazing pastures along the fea-coaft let for 40s. per acre.

* Generally 100l. per annum.

SECT. 3.—*Tithes.*

Of this bane to Agriculture, we do not find any thing, peculiar to this county, which is not common to the rest. In some parts the tithes are collected with moderation, in others with all the severity that law can enforce; some let for a term of years at a fair rent, whilst others value and let every year.

SECT. 4.—*Poor Rates.*

In Newcastle they vary from 2s. 6d. to 4s. 6d. in the pound, in times of peace; but at present, All-Saints parish is as high as 6s. per pound, owing to the sea-faring people living mostly in this parish; and the sailors being impressed, their wives and children come for support upon the parish.—At Hexham they are 2s. 6d.—Morpeth 3s. 6d.—Alnwick 1s. 10d.—Belford 2s. 6d.—Berwick 2s. 8d.—Wooler 1s. 6d.—and in other parts of the county we find they vary from 6d. to 2s. per pound.

SECT. 5.—*Leases.*

Leases—for twenty-one years, are let on most of the principal estates, especially in the northern parts of the county. Some proprietors of land in the other districts let only for nine, twelve, or fifteen years. The general time of entry is the 12th of May.* The covenants vary with circumstances; but we think the following the best calculated for improvement, and the benefit of both landlord and tenant:

After the usual reservations of mines, woods, &c. and

* Upon the Duke of Northumberland's estate the time of entry is Lady-day, and the outgoing tenant has no waygoing crop.

proviso of re-entry on non-payment of rent or alienation, &c. the tenant covenants to pay the rent—all taxes—keep and leave all in repair—not to sell hay, straw, or other fodder, from off the premises—to lay the dung on the premises, except that bred the last year—not to sow any hemp, flax, mustard, or rape, except the last for green food—not to depasture more stints the last year, than were depastured for two years preceding—to destroy the moles yearly, and scale the grass grounds—to thresh the waygoing crop in an uniform manner, and deliver a daily supply of straw to the next tenant—to keep uneaten the lands sown with grass seeds in the last year of the term, from the first of October, except one half to be eaten by the offgoing tenant after the 1st of April, to the end of the term—to permit the lessor to sow grass seeds on the waygoing crop—and to plough the lands intended for fallow five months before the expiration of the term—to have no more ploughing than* acres at one time—to fallow yearly for wheat, turnips, or other green crops, one-third of the tillage lands, and lay upon every acre cart loads of lime, *where necessary*; or, in lieu thereof, cart loads of dung—not to keep any land in tillage more than three years at one time—to lay to grass yearly one-third of the tillage lands, and sow upon every acre pounds of clover, &c. (or other seeds suited to the soil;) to keep such lands in grass at least two or three years,† before they are ploughed out again—to lay down to grass, or have in grass the last three years, all those fields called —to keep in grass

* Generally from one-third to near one-half, on the larger farms; but on some small farms it is more.

† Weak soils, improper for corn, should continue in grass 5, 6, or 7 years, or until it is thought they want refreshing by ploughing, which is only used in such situations as being subservient to stock, during

during the whole of the term, and at the end thereof leave in grass all those fields called*

and all such lands as shall be converted into watered meadows—to be at one half the expence of making new quick fences, and of cleaning and rearing them for seven years after first planted—and others, that situation or circumstances may require.

The lessor covenants, that the tenant shall have peaceable possession, and a waygoing crop from off two-thirds of the tillage lands, with the use of the stack yards, barns, and granaries, for twelve months after the expiration of the term; also to be at one-half the expence of making all new quick fences, and of cleaning and rearing them for seven years after first planted; with other covenants that may be agreed on, respecting building, &c.

SECT. 6.—*Expence and Profit.*

The expence upon a farm may be estimated pretty near the truth, for a certain number of acres; but the profits depend upon so many precarious circumstances, such as seasons, mode of culture, produce, markets, &c. that we think any estimate of profits upon a particular farm, would be a very vague criterion for judging of the rest, and most probably would not suit any other farm of the same rent or magnitude in the county; we shall therefore state the expence of cultivating an acre, supposing a farm in the rotation of three years arable and three years grass—viz.—1 year oats.

2	turnips.
3	barley.
4	} clover and other grasses.
5	
6	

* These are generally old rich grazing pastures, or meadows.

And that the first year's clover carries six sheep per acre, the second year four, and the third year two sheep per acre :—Then the expence will be as follows.

First year—for oats

	£.	s.	d.
Ploughing and harrowing	0	6	0
Seed and sowing	0	14	0
Weeding	0	1	0
Harvesting	0	6	0
Threshing and winnowing	0	5	0
Market expences and carriage	0	6	0
		1	18 0

Second year—for turnips, drilled at 30 inch intervals.

Ploughing & harrowing 5 times	1	5	0
Lime, leading & laying on	1	5	0
Leading dung	0	8	0
Spreading ditto	0	2	0
Seed and drilling	0	1	6
Hand-hoeing twice	0	6	0
Horse-hoeing twice	0	1	6
		3	9 0

Third year—for barley, sown broad-cast.

Ploughing & harrowing twice	0	10	0
Seed 3 bush.* and sowing	0	8	0
Weeding - -	0	1	0
Harvesting, threshing, mar- keting, and carriage	}	0	17 0
		1	16 0
Carried over	7	3	0

* This is the quantity commonly sown, but we think 2 bushels, or 2½ bushels, very sufficient ; and where drilled at 9 or 12 inches intervals, 1½ bushels we find a proper quantity ; which saving of seed will pay for horse and hand-hoeing, when the crop is drilled.

	£.	s.	d.
Brought over	7	3	0
4th, 5th and 6th years—clover and grasses.			
Grass seeds sown on the bar-	}	0 14	0
ley crop			
Harrowing and rolling in		0 1	0
Stoning, scaling, and catch-	}	0 5	0
ing moles for 3 years			
Attendance and other ex-	}	0 12	0
pences of sheep for 3 years			
		1	12 0
Taxes and cesses for 6 years		0 18	0
Capital employed for cultivation, &c.		9 13	0
Ditto for 12 sheep, at 26s. each		15 12	0
Total capital employed on 6 acres		25 5	0
The interest of which allowing 10	}	2 10	6
per cent. is			
To which must be added the ex-	}	9 13	0
pence of cultivation			
Gives the expence per year for 6 acres		12 3	6
Or per acre		2 0	6

The expences incurred for cultivation will be nearly the same, whatever the soil, but the produce will vary according to the quality of the land.

On good lands the produce may be,

1st year—Oats, 45 bush. per acre, at 2s per bush.	4 10	0
2 Turnips, per acre	5	0 0
3 Barley, 36 bush. per acre, at 2s 6d do.	4 10	0

Carried over 14 10 0

D 2 Clover

			£.	s.	d.
		Brought over	14	0	0
4 th year	Clover and grasses	-	3	0	0
5	Do.	-	2	0	0
6	Do.	-	1	0	0
Value of produce in 6 years			20	0	0
Deduct expence of cultivation, &c.			12	3	6
Leaves the rent for 6 years			7	16	6
Or, per acre, per year			1	6	1

If the value of the crops be,

1 st year—	Oats, 30 bush. per acre, at 2s per bush.	3	0	0
2	Turnips, - - -	3	10	0
3	Barley, 24 bush. per acre, at 2s 6d do.	3	0	0
4	Clover and grasses - - -	2	10	0
5	Do. - - - -	1	10	0
6	Do. - - - -	0	15	0
Value of produce in 6 years		14	5	0
Deduct expence of cultivation, &c.		12	3	0
Gives the rent for 6 years		2	2	0
Or, per acre, per year -		0	7	0

From the above statement it appears, that nearly the same capital will be required to carry on a farm *in tillage*, at 7s. per acre, that it does one at 26s. per acre:—Therefore, a farm of *good land* of 100l. per year, will require less capital than a farm of *bad land* of 100l. per year; and also, that when the value of the crops in 6 years amounts to no more than 12l. such lands are improper for arable, and will pay no rent;—of course the most profitable mode of employing such soils, is to let them remain in pasturage.

CHAP.

CHAPTER V.

IMPLEMENTS.

THE *Carts*—used in this county are mostly drawn by two horses; they are in general heavy, clumsy, and ill-formed, and such as we think few districts would wish to imitate; they are right-lined rectangular parallelopipeds; the general dimensions for a two-horse cart are 66 inches long, 40 inches wide, and 20 inches deep, and contain $24\frac{1}{2}$ Winchester bushels, *streaked measure*:—The usual load for two horses in Winter is 30 bushels of wheat, and in Summer 36; the first about 17 cwt. and the latter about 20 cwt. or one ton.*

Single-horse Carts—are becoming more prevalent in several parts of the county.—Mr James Johnson, a common carrier at Hexham, has a horse 16 hands high that commonly carries from Hexham to Newcastle 24 cwt. and 20 cwt. back again; and there are instances of his having carried 26 cwt. from Newcastle to Hexham, which is a very banky, heavy-pulling road.

Waggons—drawn by four horses, are used by some far-

* The neatest, most useful, and best contrived carts we know, are those made in many parts of the North-Riding of Yorkshire:—The single-horse carts of this construction, used for carrying coals from the county of Durham into Yorkshire, are 60 inches long, 36 inches wide, and 18 deep, hold 24 bushels of coals, when set round the sides with large coals and upheaped.—A man or boy drives three of these, two of which are equal to the greatest quantity ever carried by three horses.—Mr Charge, of Newton, sends three of these carts for coals every day, which bring 72 bushels of coals, the distance 26 miles there and back, and is performed in 12 hours by one man:—The same gentleman's two-horse carts bring 36 bushels of the same coals.

mers for leading coals and lime; but we hope a few years will shew the absurdity of employing such unwieldy carriages, so destructive to roads, and of so little utility to farmers.

The swing Plough—made in imitation of the Rotherham plough, is in general use through every part of this county;* its form is constantly varying, no fixed rules being known for its construction; scarce two carpenters making them alike, differing widely in length and height of the beam, point of yoking, form of mould-board, &c. &c.—To remedy these defects it was intimated, in the first edition of this Report, that “*An Essay on the construction of the Plough, deduced from mathematical principles,*” would be soon offered to the public.—This Essay is now published,† from which we have extracted the following

“ PRACTICAL CONSTRUCTION

For determining the position and dimensions of the most essential parts of a Plough.

“ That the operation of ploughing may be performed with the least loss of power, it is necessary to know the height and inclination of the horse’s shoulder.

“ While a horse is in the act of pulling, the inclination of his shoulder varies from 69 to 75 degrees, according to circumstances, the medium is 72 degrees; and the medium height of the point of draught on the shoulder of a horse, $15\frac{1}{2}$ hands high, is 48 inches.

* The farmers of this district have always had the good sense not to load their teams with *wheel ploughs*, as wheels in general destroy a considerable portion of the power of the team, (besides their additional weight;) hence the absurdity of recommending *Norfolk ploughs* to those districts, where the simple *swing-plough* has been used and properly understood.

† For Messrs Robinson, London, price 2s.

“ These

" These data being got from experiment, and the depth to be ploughed (suppose 6 inches) given,

" Draw a right line AB, and at any point (fig. 2, pl. 1) A, erect a perpendicular AP, equal to 48 inches.

" With AP as a radius, from P as a center, describe a quarter of a circle AQ, which divide into 90 equal parts or degrees.

" From P, through 72 degrees, draw a right line to meet AB in B.

" Set the length of the traces and swing-trees from P to H; this is commonly 102 inches.

" From H, upon AB, let fall a perpendicular HI, which measured on the scale that AP was taken from, will give *the height of the beam* $HI = 16\frac{1}{2}$ inches.

" Then at the distance of *half the depth* the land is intended to be ploughed (in this case 3 inches) draw a line parallel to AB; and from C, where it intersects PB, let fall a perpendicular upon AB to S, which will give the point of the sock; and a line drawn through C, making an angle of 45 degrees with BA, will be the position of the fore-edge of the coulter.

" The heel of the plough will be got by setting the length of the sole 36 inches from S to L.

" The length of the beam will be determined by taking the distance from H to any fixed point, as S, or B, or L, and applying it to the scale of equal parts.—In this case $HS = 44\frac{1}{2}$ inches.

$HB = 53\frac{1}{2}$ do.

$HL = 79$ do."

The form of the mould-board is such, that the sod to be raised presses equally against it on every part, from the sock point S, to where it leaves it at K; it also differs from other mould-boards in not beginning to take its rise from the bottom opposite to the heel L, but at least 12 inches farther forward towards the sock, and in being cut

away at the bottom opposite the heel L, about 3 inches high, (from the sole) by which the turning of the sod is much facilitated.

For the demonstration of the principles from which the above construction is derived, as well as the investigation and practical directions for making the mould-board,* and finding the curve of the breast GS, with many other essential properties, we must beg leave to refer to the afore-mentioned essay; and only observe, that wherever these ploughs have been properly tried, they have answered the intention; being allowed, by all who have seen them at work, to go with more ease to the horses than any other.—The best mode of applying the draught, is by two horses yoked double, and driven with cords by the holder; which are sufficient for ploughing the strongest lands, and will in general do an acre per day.†

The single-horse Plough—for ploughing between the rows of drilled turnips, is represented in fig. 3, pl. 1, the mould-board of which moves upon two hinges, placed on the inside, and is set wider or closer as circumstances require, by the crooked piece of iron A (fixed to the stilt) being shifted along the flat piece of iron, placed upon the top of the mould-board with holes in it:—The width at the bottom when closest is 5 inches, and when widest, 9 or 10 inches.

The capstan is made with holes in it at C, for regulating the breadth of the furrows; and at D, for increasing

* Cast iron mould-boards of this form, with maundrells for forging the socks upon, may be had of Messrs Whinfield and Co. iron-founders, Newcastle upon Tyne.

† Upon Wark-haugh, a *strong deep loam*, a young Nobleman, who did not think it any disgrace to make himself acquainted with the profession of Agriculture, with one of those ploughs and two horses (yoked double and driven by himself) ploughed *two acres* per day, and not less than *six inches deep*, the third furrow or fallow.

Plate I.

Fig. 1.

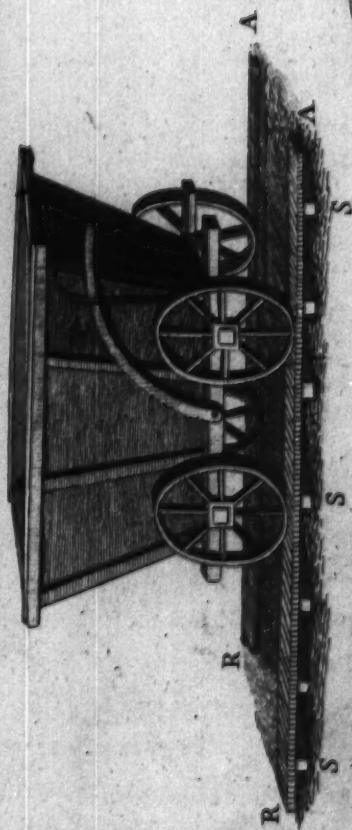


Fig. 2.



or decreasing the depth. The price of this plough, when compleatly finished, is 11. 5s.

A double mould-board Plough,—is made by putting on another mould-board, with hinges on the other side, but about six inches longer.

A Horse hoe,—for hoeing the intervals between beans drilled at 30 inches distance is represented (*fig. 4, pl. 1.*) The beam AB is 5 feet long, and its height at B 16 inches: the curved sides, CF, DE, are described with a radius of 24 inches from G and D as centers; the length of the stilts from A to F, 42 inches; the length of the shanks of the hoes from G, to the underside of the beam, is 15 inches; their length, GH, $7\frac{1}{2}$ inches; and breadth, GI, $5\frac{1}{2}$ inches. This horse-hoe, with the coulter and hoes placed as in the figure, will penetrate and compleatly hoe strong lands in dry seasons, when it would be in vain to attempt to stir them with a plough or hand-hoe.

For hoeing the intervals between turnips, or other crops where the soil is light, the coulter is taken out, and other sets of hoes put in the holes made in the sides CE and DE, and end CD, to hoe from 18 to 30 inches at once; for this purpose, in *dry seasons*, it is preferable to the single-horse plough above described; and with proper formed hoes, will answer all the other purposes of expensive scufflers, cultivators, and quicken rakes; though no more than a single-horse be required to draw it, and its price be only 30 or 40 shillings, according to the number and variety of the hoes.

This implement answers very well for hoeing wheat or barley, drilled at 10 or 12 inch intervals, by making it a little wider, so as to take in four hoes.

Harrows.—A large heavy harrow called a brake, is commonly used for reducing rough land, especially fallows.

Single

Single-horse harrows, containing four bulls, and 24 tines or teeth, five or seven inches long, (below the bull) are generally used for harrowing-in seed, after it has had a singling by the brake; a man drives three horses, and every horse draws his own harrow. Some people use two horse harrows, joined in the middle by crooks and loops; and also small light harrows with short tines, for putting in grass seeds.

Rollers—for reducing cloddy land, rolling wheat in the Spring, and grass seeds, are mostly made of wood; they are generally $5\frac{1}{2}$ feet long, and from 12 to 30 inches diameter: those used for flattening the tops of one-bout ridges, for drilling turnips upon, are 5 feet long, and 10 or 11 inches diameter; the framing is various, but that shewn in the annexed drawing is the most general (*pl. 2, fig. 3.*) The rope by which the drill is drawn is fastened to the bar B, and is slipped from one end to the other, at every turning, to suit the sowing. To prevent the accumulation of earth upon the roller, a thin piece of wood C, is placed at its back, to act as a scraper.

A drill for sowing Turnips, on the tops of *one-bout ridges*.—When this mode of cultivating turnips was first introduced, the only drill used was a hollow cylinder of tin, with a small hole in the bottom, thro' which the seed was shook: if this orifice be made of such size as to deposit a proper quantity of seed, it is very liable to stop, and of course large spaces are totally missed; if made so wide as to prevent this inconvenience, it then sows far too much: This defect induced me some years since to construct one upon different principles, which is now coming into general use.

The most essential parts of this drill consist of a solid cylinder C (*fig. 1, pl. 2.*) of iron or brass, 2 inches diameter, and 1 inch broad; on the surface are made or punched 15 or 16 cavities, of the form of a semi-egg,
cut

Fig. 1.

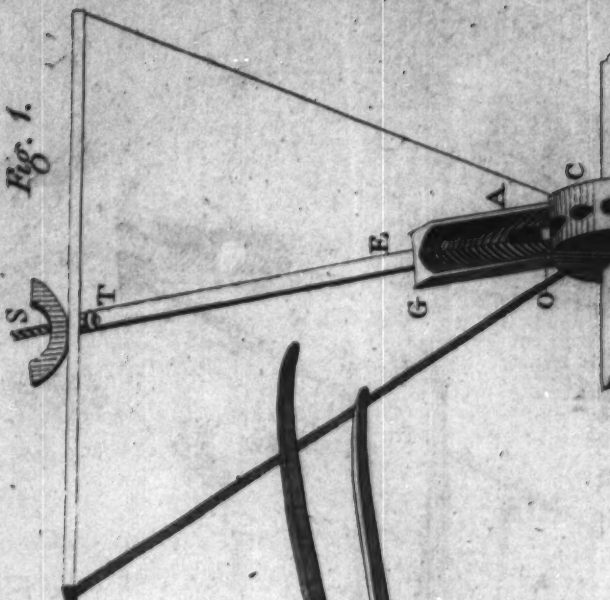
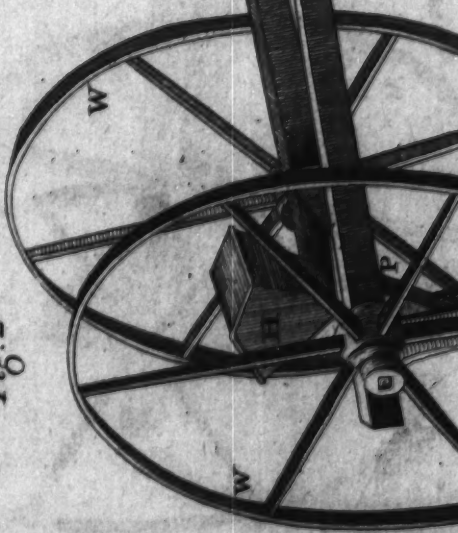


Fig. 2.



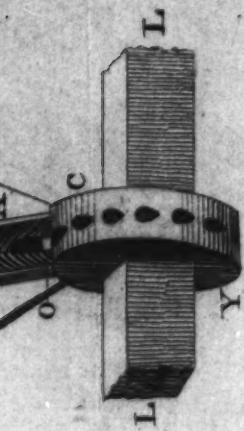


Fig. 4.

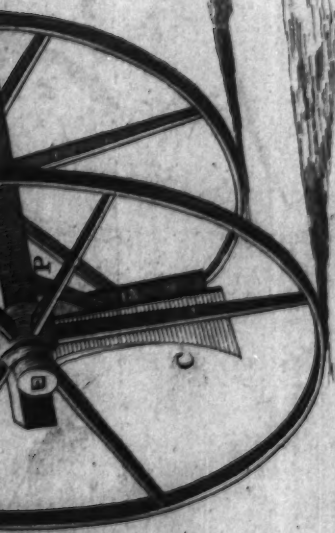


Fig. 3.



cut length-ways, and so deep as to hold 4 or 5 seeds each. On the back part of this cylinder (a little below the top) is placed the hind part of the hopper, to which is fixed a piece of iron or brass GA, one inch long, and $\frac{1}{4}$ broad, hollowed on the inside into the form of a Gothic arch, (as in *fig. 4.*) the sides of which meeting the sides of the cavities in an *oblique angle*, prevent the seeds from bruising; at the lower end of this piece of iron (which may be called a gatherer) is made a slit $\frac{1}{8}$ of an inch long, and $\frac{1}{8}$ wide; and at the back of it, a thin flat piece of iron TE, moves up and down, by means of a screw S, at the top of the hopper, which enlarges or lessens the orifice O, directly above the cavities, and increases or diminishes the quantity of seed delivered, as the operator thinks necessary: — This slip of thin iron (which may be called a regulator) is let into a groove made in the board which forms the back part of the hopper.

This cylinder CY, before the cavities are made, is fixed on an iron axle LL, 1 inch square, and turned very true, as well as are those parts of the axle which turn in the collars, or thimbles, fixed in the shafts or handles DD, (*fig. 2, pl. 2.*) To the ends of the axle are fixed two wheels WW, 26 inches diameter, that turn the axle and cylinder round; which in passing thro' the hopper H (filled with turnip seed) bring forward in each cavity a number of seeds, and drop them into the spout P, which are conveyed by it to the coulter C, that forms a channel on the top of the one-bout ridge SD (*fig 3, pl. 2.*) for receiving them,—where S is the channel, and D the dung directly under the seeds.

If the cavities be made to hold 5 seeds when the regulator or tongue is screwed close down, and there be 16 cavities, it will then deposit 80 seeds in one revolution; and as the diameter of the wheel is 26 inches, the circumference will be $81\frac{1}{2}$; in this case 80 seeds will be deposited
in

in $8\frac{1}{2}$ inches, or nearly 12 in a foot:—From this minimum quantity, by screwing up the regulator, the number may be increased gradually to 50 or 60 in a foot; which is far too much, unless in very particular and unfavourable situations.

The price of this drill, is 1l. 5s.

Drills,—for sowing the different kinds of grain, used in this county: not being able to regulate the quantity of seed, to suit different soils, seasons, &c. we mentioned in the first edition of this Report, that a drill was then making, which would remedy those complaints; a description and drawing of which, being published in the Appendix to the Essay on Ploughs, mentioned in p. 38, we take the liberty of extracting from thence, “*A description of a drill, upon a new construction, for sowing all kinds of grain, in any quantity, and at any distance.*”

“The inside part of the drill, by which the quantity of seed is regulated, is represented by *fig. 1. pl. 3*, where AX is an iron axle, 1 or $1\frac{1}{2}$ inch square, upon which are fixed, at 9 or 10 inches distance, five, six, or more, brass fluted cylinders, the flutes being rather more than a semi-circle $\frac{1}{2}$ of an inch diameter, or $\frac{1}{4}$ wide and $\frac{1}{8}$ deep.

“RM are hollow cylindrical rims of hammered iron, which have segments turned down at right angles, to fit exactly the flutes of the brass cylinders; the cavities of which are increased or diminished by the segments of the iron cylindrical rims sliding backwards or forwards in the flutes. This is performed in all the cylinders *at the same time*, by a rectangular space (n) being made in the brass cylinders, through which passes a straight piece of iron IN, moving on friction wheels at I, and fastened to the plates at LK, and also to the cylindrical rims RM.

“LV is a lever, the fulcrum of which is F, and moved by

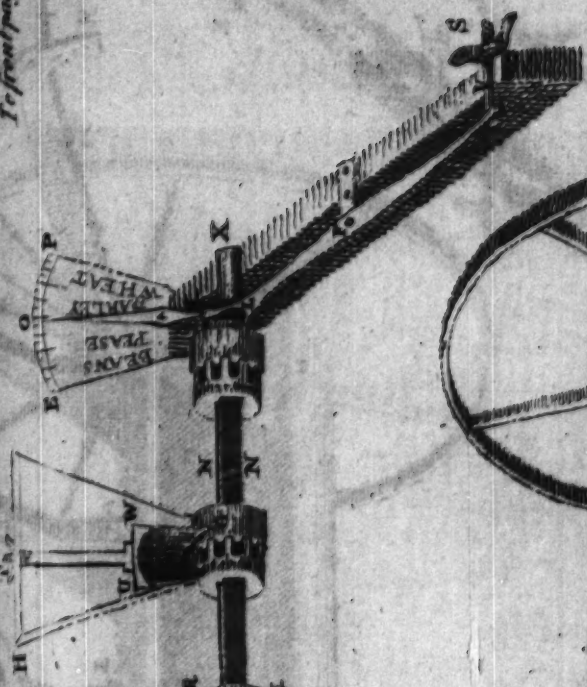
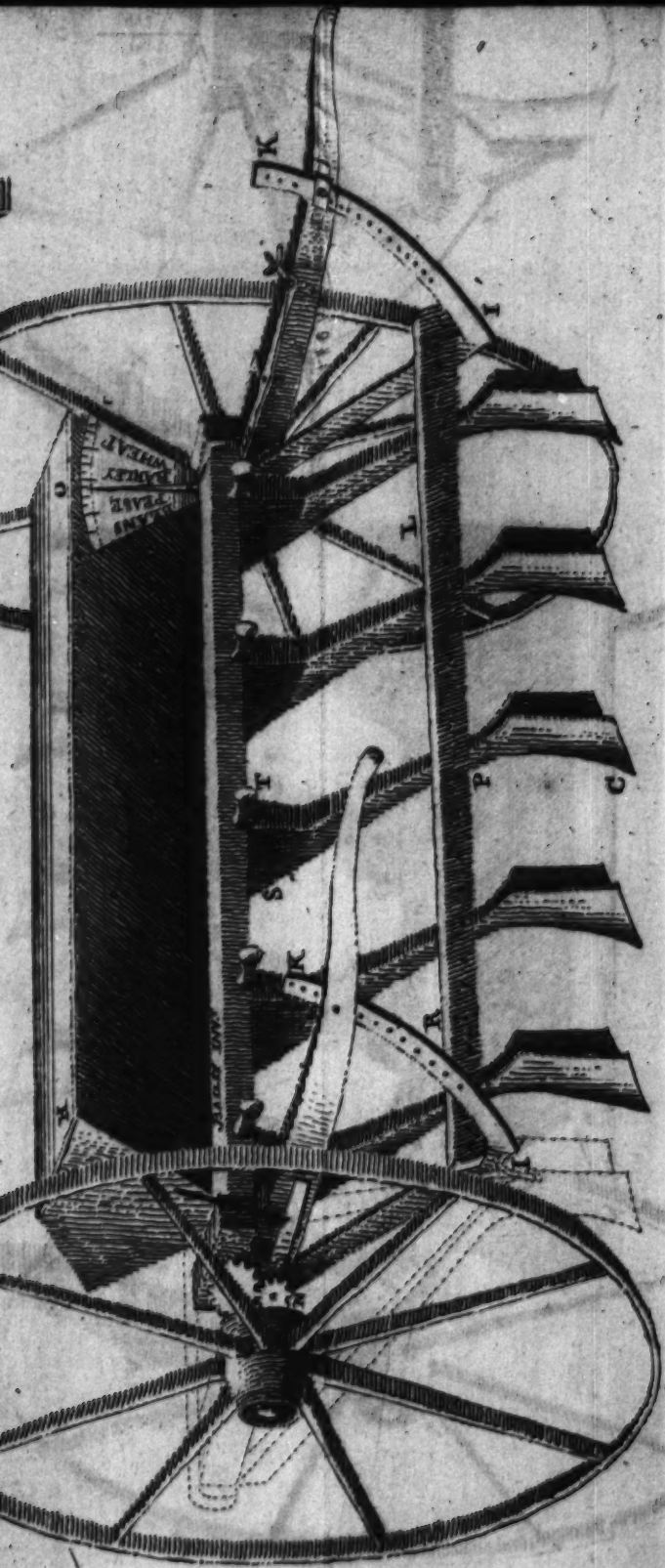


Fig. 1.



Fig. 2.



by a screw S, passing through the frame at V. The end at LK is forked, and made to *fit exactly* the sides of the collar or plates of iron JK.

“ By turning the screw S, the lever moves the whole of the rims at once, and the cavities are increased or diminished at pleasure,* and almost instantaneously, to sow *any kind of grain*, and *in any proportion*, which is shewn upon the scale EOP, by the index KO fixed to the end of the lever at K.

“ *Fig. 2, pl. 3.* is a view of the machine when ready for work;†” and for a more particular description, for regulating the depths, distances, &c. we beg leave to refer to the above-mentioned Essay.

For Turnips,—the large hopper is taken off, and a set of small ones fixed upon the half-egg cavities at the end of the brass cylinders: The quantity is regulated by a tongue screwing up and down, as described in the turnip drill (*fig. 1, pl. 2.*)

For sowing *beans* or *pease* at wide intervals, viz. from 27 to 30 inches, I use a drill with only one wheel and one cylinder, which a man wheels before him in the furrow, or (what I find much better) it may be fixed in the body of a small plough, (drawn by a single horse) with one stilt that passes between the wheel and the seed-box, (*fig. 5, pl. 1.*) By this means the wheel moves along a smooth surface between the land-side and mould-board M, and the seed is deposited at a regular depth: two inches answers very well for beans. With the same small plough and drill I have sown both wheat and barley, at different

* This is done with the greatest facility and readiness, even while the machine is going and at work; which is frequently necessary, where the land varies considerably in quality, upon different parts of the same ridge.

† The coulters and spouts may be hung differently, as represented by the dotted lines, and which is probably the better mode for hilly lands.

intervals from 6 to 12 inches, and $1\frac{1}{2}$ or 2 inches deep, with good success; and, for small concerns, this cheap and simple apparatus will probably be found the most eligible.

It is fixed to the plough by two pieces of iron going from the ends of the drill; one to the beam at B, and the other to the flint at C, and moving round, on bolts, allow the wheel W to fall and rise with every accidental hollow or eminence.

The low part of the coulter is knee'd or bent, to bring it to the same plane with the land side of the plough.

Threshing Machines—are now becoming general in the northern parts of the country; they are all upon the principle of the flax mill; which principle was first introduced into this county for threshing corn, by Mr Edward Gregson, near 32 years since; the machine he used was worked by a man, who could thresh with it 12 bushels of wheat in a day; but being hard work, and Mr Gregson dying soon after, it was neglected. Mr Wm Menzie, who was servant with Mr Gregson at the time, says “that his master took the idea from a small flax mill which a Scotchman travelled the country with, for the purpose of swingling the flax which the farmers grew for their own use: this portable flax mill was carried in a cart from one farmhouse to another, being a cylinder of 5 or $5\frac{1}{2}$ feet diameter, and 18 inches wide; the switchers were driven by his foot, with a crank like a cutler’s wheel; and that the threshing machine Mr Gregson had, was made at that time, and exactly the same as the said flax mill.”—Mr Tho. Gregson thinks that his brother Edward had seen something of a similar nature in Scotland, probably the same which Mr D. Meldrum gives an account of, about the same time, in a letter to Mr William Charge of Cleasby, in the county of York, which he describes as being the same as the flax mill; that it threshed 150 bushels of
oats

oats a day, which dropped through a skreen into a winnowing machine, that dressed at the same time.

Some time after this, Mr Oxley erected a threshing machine at Flodden, moved by horses, in which the corn was fed-in betwixt two *fluted rollers*, and struck by switchers, placed as those are in the present machines; only they are *hung on hinges*. Those in use now, are *fixed* as were those of Mr Gregson's. The complaint of Mr Oxley's machine was, that it did not thresh common oats clean, probably for want of velocity; for it is found in the machines now used, that if the switchers move with a velocity of 1500 feet per minute, they will not thresh clean; and experience has proved, that to thresh common oats clean, requires a velocity of 2500 feet per minute.

Mr Ilderton erected two threshing machines, one at Ilderton and another at Hawkhill, worked by horses, the principle of which was to rub the grain out by projecting pieces of wood, (on the circumference of a large cylinder) rubbing against several *fluted rollers*: he used it many years, but it was frequently necessary to put the straw twice thro' before it was perfectly clean.

We were informed by the late Sir Francis Kinlock, Bart. of Gilmerton, Scotland, that while he was attempting to perfect Mr Ilderton's machine, he saw a portable flax mill, made for the use of poor families, worked by a man. It struck him that it would thresh corn, and he got one made, with the addition of two smooth rollers for taking in the corn; the work being too hard for a man, he sent it to Mr Mickle's mill, to have it tried by water: soon after, Mr Mickle's son built a threshing mill at Kilbogie; and after ten or twelve had been erected in the neighbourhood, by other workmen, he applied to Mr Kinlock to take out a patent, who told him that he did not look upon it as an original invention, and that a patent

ent would not be of any use. Some time after this, Mr Mickle took out a patent (for England only) in his own name, for the purpose we suppose of securing to himself his own combination of wheels, &c. for movement of the various parts, as the leading principle of the machine had been applied to the same purpose at least 20 years before.*

At their first introduction into this county, the corn and straw were thrown out together upon the floor, and caused great confusion: to remedy this, a skreen was added, thro' which the grain dropped into a winnowing machine, and from off the skreen the straw was taken by a man: but a *circular rake*, invented about eight years since,† performs the operation much better; and at the same time saves a considerable expence. This rake is now added to all those that have been lately erected; and only causes an addition to the machinery of one light wheel. These machines are moved both by water and by horses; two, four, and even six of the latter are sometimes employed; the former is certainly the best power where it can be obtained.

From a review of the whole, it appears that the principle of the flax mill had been applied by different persons at different times, for the purpose of threshing corn; and since its being more generally used, different persons have invented and used various combinations of wheels and other contrivances to effect the same purpose, and render the machine more perfect.

The simplest and most useful combinations and contrivances are certainly the best: but whose are entitled to

* Mr Mickle is a very ingenious mechanic, and tho' it appears he has not the merit of being the original inventor, yet he has added many useful improvements.

† By Mr Bailey, who first applied it to his machine at Chillingham.

this appellation we do not pretend to determine; the public must judge for themselves.—The combination we shall offer is different to any we have seen, for which reason, and being that where the first circular rake was applied, we shall give

*A description and calculation of a Threshing Machine
erected at Chillingham.*

In *pl. 4, fig. 1*, BB, is a horizontal board or table 5 feet long by 3 ft. 4 ins. broad, on which the corn CC is *evenly spread*, and presented to the cast-metal fluted rollers RR (4 inches diameter) which take it regularly in, and by their weight and sharp edges hold fast the straw, while it is struck, switched, or threshed, by the switchers, or pieces of wood SSSS, fixed in the cylinder DD, and projecting 3 inches from its surface;* these, when they strike the corn, move in an upward direction RE, with great velocity, and throw the corn as it is threshed, and the straw as it leaves the fluted rollers, against the circular rake KK, and upon the wire screen G, from whence the straw is taken by the rake, and delivered upon the sloping board L, down which it slides to the floor N, while the corn passes thro' the screen G into the hopper H, and from thence to the inclined board I; but in falling from H to I, a strong current of air, raised by the fanners FFF, blows the chaff over the sloping board O, and the light corn against it, which falls into the space P, and the chaff into M, while the good grain slides down the inclined board II, to the floor at Q, from whence it is taken and put into a second winnowing machine, in which are placed proper riddles to suit different kinds of grain: This second machine is moved by a rope going

* This cylinder is made with strong arms, on which are fixed the switchers, and cased round with narrow inch deals; the whole secured from flying off by strong iron hoops, surrounding them at each end; the switchers are covered with plate iron, to prevent their wearing.

over a pulley, fixed in the axle T, and is set a-going, or stopped, at pleasure, by a stretching pulley, as occasion requires.

Where the situation will admit of the board II, being placed about 4 feet from the floor, the second winnowing machine may be placed directly under it, and save the trouble of lifting the corn.

To find the velocity of the particular parts,—we must divide the product of the number of cogs in the driving wheels, by the product of the number of cogs in the driven wheels, and the quotient will be the number of revolutions made by the last moved part, for one of the first moving part.

The whole is put in motion by an overshot water wheel 14 feet diameter, which makes from 5 to 6 revolutions per minute, according to the supply of water; on the axle of this water wheel is fixed a large spur wheel *aa*, of 160 cogs (152½ inches diameter) which drives a cast-metal pinion *b*, of 16 cogs (15,28 inches diameter) on the axis of which is placed another spur wheel *c*, of 63 cogs (60,1 inches diameter) that drives the cast-metal pinion *d*, of 16 leaves, (15,28 inches diameter) on the axis of which is fixed the cylinder DD, (4 feet diameter, and 5 feet long) with the four projecting pieces of wood, or switchers, SSSS, that switch or thresh the corn, as described above.

Then $\frac{160}{16} \times \frac{63}{16} = 39,375$, the revolutions of the cylinder for *one* of the water wheel,

which, multiplied by 5,5, the medium revolutions of the water wheel per minute,

gives 216,562, the revolutions of the cylinder per minute;

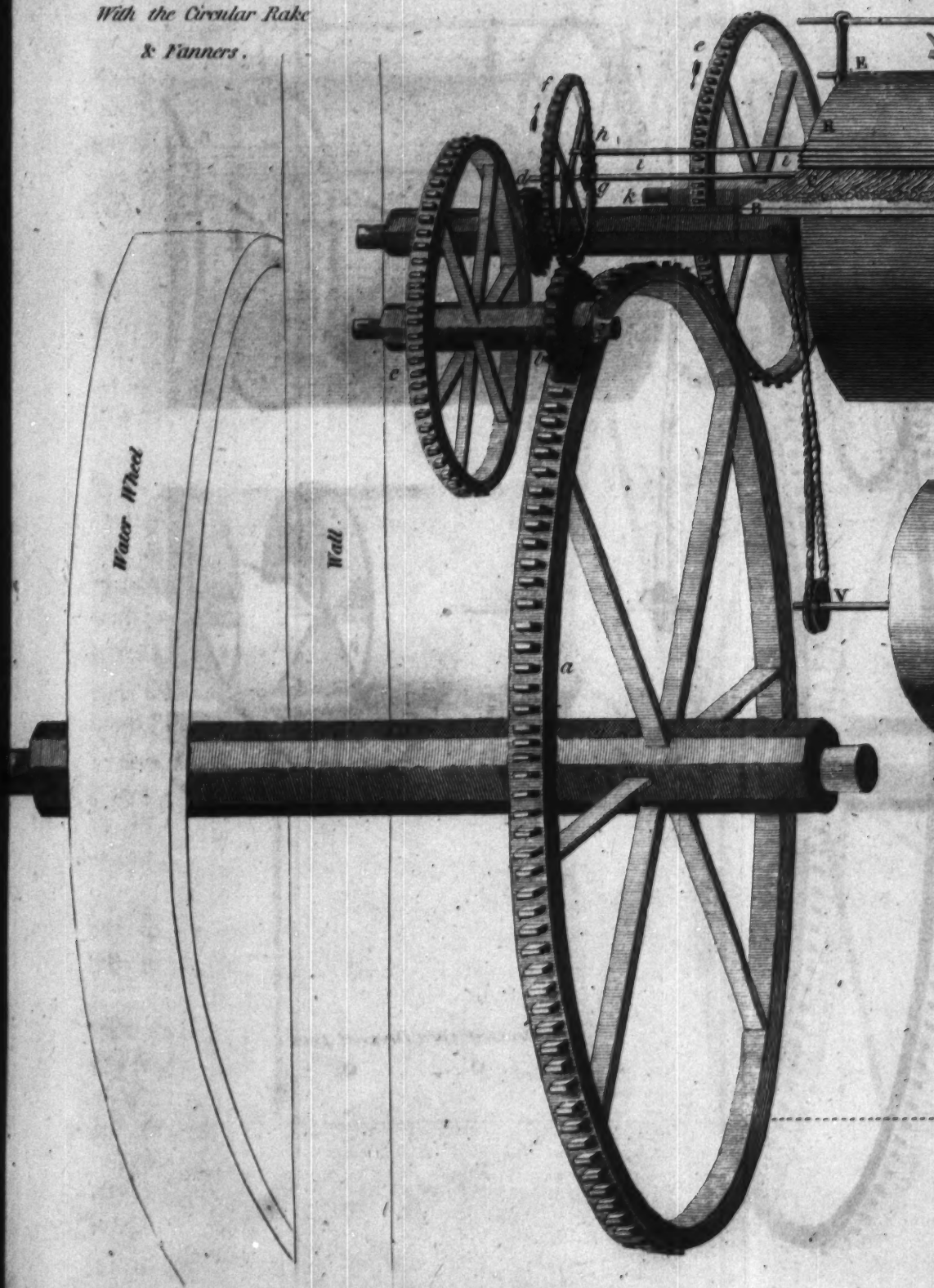
this multiplied by 4 the number of switchers,

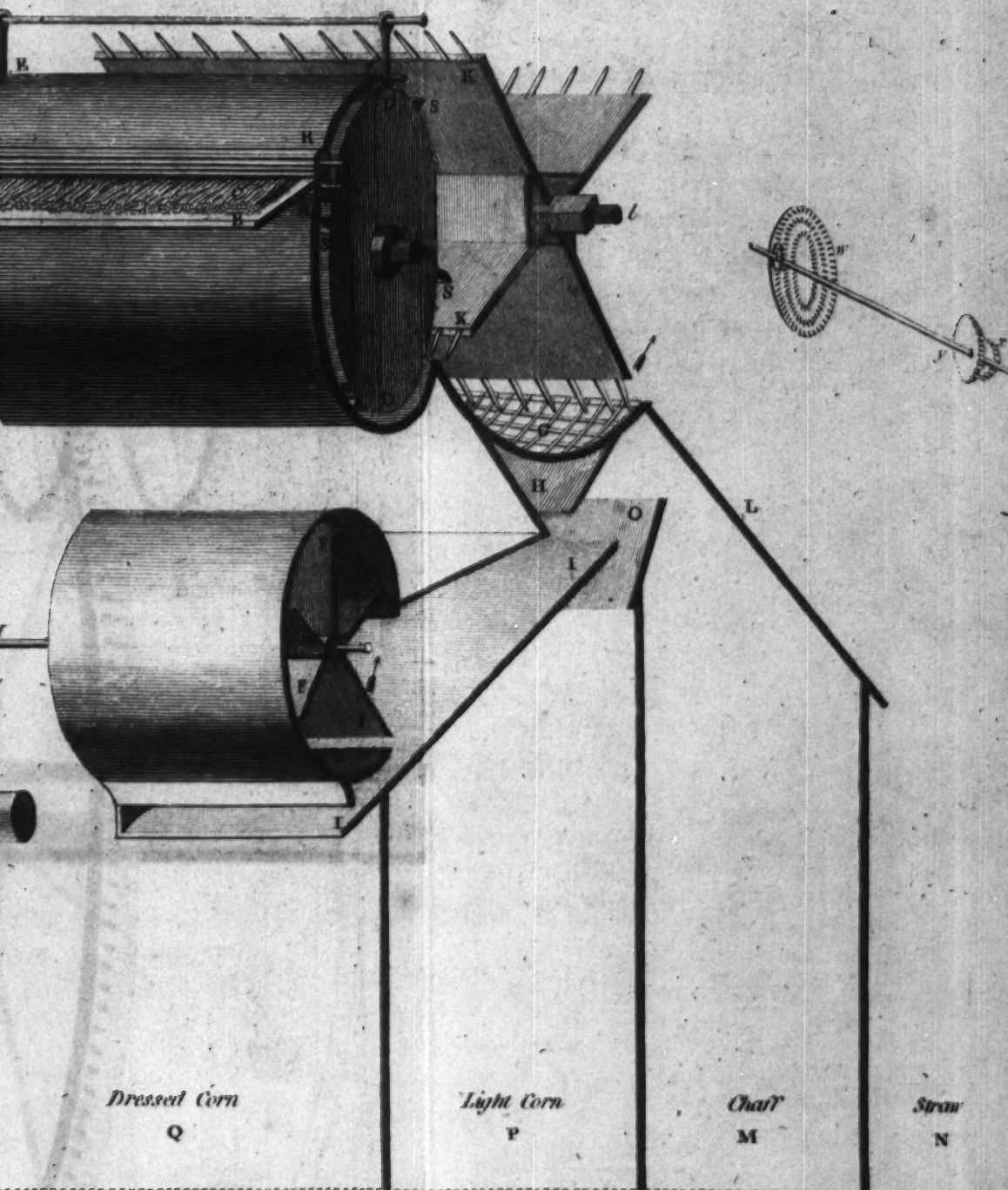
gives

A View of the 'THRESHING MACHINE

Erected at Chillingham, 1789.

With the Circular Rake
& Fanners.





Dressed Corn
Q

Light Corn
P

Chaff
M

Straw
N



gives 866,25 the number of strokes
per minute.

And as the diameter of the cylinder is 4 feet, the circumference will be 12,56;

therefore - 216,5625, the revolutions of the cylinder per minute,

multiplied by - 12,56 feet, the circumference of
——— the cylinder,

gives - 2720 feet, the velocity of the
switchers per minute.

The large spur wheel *a*, also drives the light cog wheel *e*, of 63 cogs (60,1 inches diameter) fixed on the axis *kl*, of the rake, for taking away the straw.

Then $\frac{160}{3} = 2,54$ the number of revolutions, which
the rake makes for one of the water
wheel,

multiplied by 5,5, the revolutions of the water wheel
—— per minute,

gives - 13,97, nearly 14, the revolutions of the
rake per minute; which having 4
arms, will clear the screen of straw
56 times per minute.

The Rollers,—are moved by the pinion *b*, of 16 leaves, working into the slight cast-metal wheel *f*, fixed on the iron axis *ii*, of the lower roller, on which axis is also fixed a small pinion *g*, of 8 leaves, working into another *h*, of equal number, fixed on the axis* of the upper roller, which gives the two rollers an equable motion, for taking in the corn.

Then $\frac{160}{16} \times \frac{16}{3} = 4,444$, the revolutions of the rollers
for one of the water wheel,

* This axis is fixed into the upper roller, either by an universal joint, or with a square tapering end, to allow the upper roller to rise and fall, according as the corn is fed-in thicker or thinner, and the concave board RE, is hung on a bolt, to allow it to rise and fall with the roller.

multiplied by - 5.5

gives - 24,44, the revolutions of the rollers
per minute.

And the diameter of the rollers being 4 inches, the
circumference will be 12,566 inches;

therefore 12,566 inches, the circumference of the
rollers,

multiplied by 24,44, the revolutions of the rollers per
minute,

gives - 307,1 inches of straw passing thro'
the rollers per minute; which
307 inches receive 866 strokes
of the switchers in that time, or
nearly three strokes to an inch.

When the rollers are required to move swifter or slower, they may be driven very conveniently from the end of the axle of the rake, by fixing a cast-metal *faced wheel* on it, with three rows of cogs, (8, 10, and 13) working into a shifting pinion of 8 leaves, fixed on an iron axle; at the other end of which is put a small *bevel wheel* of 12 teeth, working into another of 8 teeth on the end of the axle of the lower roller.

The Fanners,—are moved by a *crossed rope*, passing over a pulley T, 10 inches diameter, fixed on the axis of the cylinder, and another V, of 8 inches diameter on the axis of the fanners. Then as the axle of the cylinder makes 216,56 revolutions per minute, we have $216,56 \times \frac{1}{2} = 270,7$ revolutions of the fanners per minute.

From the above it appears, that when

The water wheel makes	5½ revolutions in 1 minute,
The cylinder will make	216½ ditto,
The rollers	- 24½ nearly,
The rake	- 14 ditto, and clears the screen of straw 56 times per minute.

The

The fanners - 270 $\frac{1}{2}$ ditto,
 The switchers make 866 strokes per minute,, and
 move with a velocity of 2720 feet per minute.

The rollers take in nearly 300 inches of corn per minute: The medium length of good oats is about 30 inches; and, supposing half a sheaf put in at a time, a whole sheaf will then be equal to 60 inches:

Therefore $\frac{1200}{60} = 5$ sheaves per minute; which agrees with the usual rate of going of this machine, when supplied with a *medium* quantity of water. From some experiments lately made, 120 sheaves of oats were threshed in 22 minutes, and yielded 12 bushels, which is at the rate of 33 bushels per hour, or 264* per day of 8 hours.

The expence, for the attendance on the threshing and dressing part of this machine, is only that of three women, viz: One to feed-in, another to hand the sheaves to the feeder, and the third to take away and riddle the corn after it is winnowed; of course the expence of threshing and dressing 264 bushels is only 1s. 6d.

The expence of threshing the same quantity by the flail, would be one twenty-fifth part,† or 10 $\frac{1}{2}$ bushels, which at 2s. per bushel is 21s.; to which must be added 2s. the expence of a man and two women, to assist in winnowing, making in all, 23s.

The expence of erecting a threshing machine of this

* This must be considered as a medium quantity; of short early oats 320 bushels might be threshed in the same time; and of wheat with long straw, not more than 180 bushels: But a great deal depends on the care and *constant attention* of the feeder; a trifling neglect in this point, will make a considerable deficiency in the above quantities, which we find is too often the case.—Where there is plenty of water, so that a whole sheaf may be put in at once, the quantity will be double to the above.

† The wages here for threshing are, one twentieth part of the grain, when the thresher *folds or bundles up the straw*—and one twenty-fifth when the straw is *taken away loose*, as fast as he threshes it; the thresher assists in winnowing, and finds a woman for the same purpose; the farmer finds a man and two women.

kind, was from 70 to 80l.; but since the advance of wood, iron, and wages, it will be now near 100l.

Machines of small dimensions are erected for about 50l. which, with 2 horses, will thresh and dress 120 bushels of oats, or 60 of wheat, in 8 hours.

Rollers, or small *Millstones*, are added to many of these machines, for crushing or grinding grain, for horses, swine, &c. Knives for cutting straw, and many other useful appendages, might be added.

The Winnowing Machine is in universal use here; we believe very little, if any corn is dressed by any other means: They were first made by a farmer of a mechanical genius called ROGERS, who lived at Cavers near Hawick, and whose grandson, now a carpenter there, still makes them, perhaps of as useful a form as any other person, and at as low rates as from 2l. 8s. to 3l.

Old Rogers, we are told by his descendant, happened in the year 1733 to see a machine, thrown out of the way as useless, in an old granary at Leith, of which he took such notice, that, on his return home, he set about making one, the utility of which soon recommended it to many principal farmers: in a few years they were universally used, and are now become so absolutely necessary, where large quantities of corn are to be dressed, that it would be attended with considerable inconvenience to do without them; of such great utility has been the superior discernment of this ingenious and unnoticed individual!

The present Mr Rogers says, he believes the machine his grandfather saw at Leith, was brought from Holland: An anonymous remarker, who signs himself a Scotch Farmer, states "that it was first introduced by the late celebrated Andrew Fletcher of Saltoun, along with the barley mill, from Holland, in the year 1711;" and we have somewhere read or heard, that the Dutch brought it from

from the Chinese, which is corroborated by the information we lately received from the Honourable Mr Douglass,* who was shewn (when on his travels in France) by the late Duke de Rochefoucault, a set of Chinese drawings, representing the culture of rice in all its stages, from the first planting to its being prepared for sale, and that the last drawing was a representation of the *dressing* or *winnowing*, which was performed by a *machine exactly similar to that we now use for the same purpose*.

Dr Desagulier's blowing wheel, which he presented to the Royal Society in 1734, is exactly on the same principles.

Two men and three women will winnow, dress and measure up into sacks, 250 bushels of oats, or 150 bushels of wheat, per day,—the expence 3s. 8d.

A pair of pruning shears, represented in fig. 1, pl. 5, have been particularly recommended by Mr Tweddell, of Threepwood, to the President of the Board, as being superior to any other implement for the purpose of cutting hedges.—They consist of a strong sharp knife 6 inches long, moving betwixt two square-edged cheeks; the upper handle is 2 feet 6 inches long, and the other 2 feet 3 inches.

There are many other implements used in this county, but as we believe most of them are such as are well known in other parts of the kingdom, it would be of little use to describe them here.

CHAPTER VI.

INCLOSURES.

THE parts of this county capable of cultivation are in

* A son of the Earl of Selkirk.

general well inclosed by live hedges; the only exception is a small part of the vales of Breamish, Till, and Glen: but even here, the advantage of having well-fenced fields is so well understood, and so much desired by the tenants, that we hope, in eight or ten years, the whole of this valuable district will be inclosed by proper fences.

The size of inclosures varies with the size of farms. In some parts, from two to six or eight acres; in the northern parts, where the farms are large, the fields are from 20 to 100 acres.

The fences most generally used for new inclosures, are earth mounds; at the base of which, and on the edge of the ditch out of which they are raised, are planted the quicks, generally upon a turned sod six inches high; which we think too low, as we always find the quicks grow much better when planted three sods high, with the thickness of two surface sods laid under their roots. This in most cases doubles, and in thin soil trebles, the surface soil, and forms a thick bed of the best earth for the roots of the quicks to grow in, as will be more clearly seen in the annexed sketch of such a fence, fig. 2, pl. 5, where AB is the ditch, $4\frac{1}{2}$ feet wide at top; BCD the mound; the base BD, six feet wide; and height CD, four feet. Q, the quicks planted upon three turned sods, at least 15 inches high, with surface sods and soil 12 inches thick, under and behind their roots.—The expence of making this kind of fence, is 1s. 4d. per rood of 7 yards, exclusive of quicks and railing.

The quicks should never be planted nearer each other than nine inches, and upon good land a foot. Quicks four or five years old, with strong clean stems, are always to be preferred to those that are younger and smaller.

It is a custom, in some parts, to clip young quicks every year; this makes the fence look neat and snug, but it checks their growth, and keeps them always weak in the stem,

Fig. 1.

Plate V.



Fig. 2.

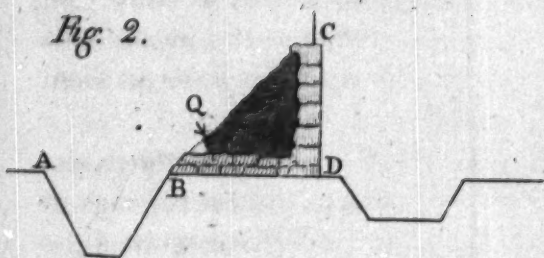


Fig. 3.

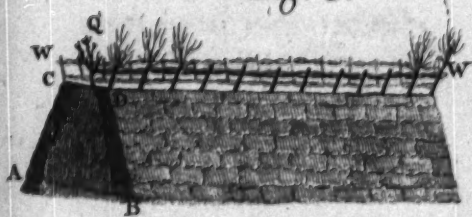


Fig. 4.

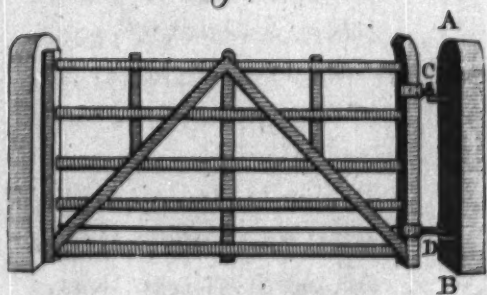
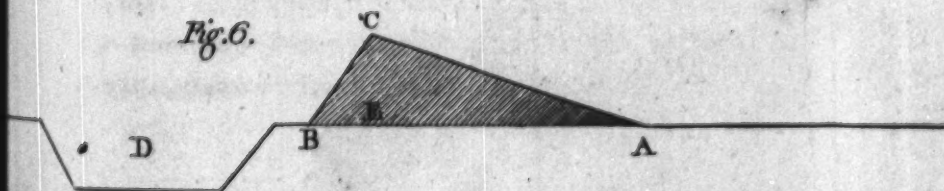


Fig. 5.



Fig. 6.



stem, and, when they grow old, open at bottom; while those that are left to nature, get strong stems and side branches, which by interweaving one with another, make a thick and impenetrable hedge, and if cut at proper intervals, (of nine or ten years), will always maintain its superiority, over those that have been clipped from their first planting. In point of profit, and of labour saved, there is no comparison; and for beauty, we prefer nature, and think a luxuriant hawthorn in full bloom, or loaden with its ripened fruit, is a more pleasing, enlivening, and gratifying object, than the stiff formal sameness produced by the shears of a gardener.

Walter Trevelyan, Esq; of Nether-Witton, shewed us a new mode of raising fences:—He erects an earth mound (fig. 3, pl. 5,) 7 feet wide at bottom AB, 4 feet wide at top CD, and 5 feet high; on the middle of the top he plants a row of quicks Q, and on each side at 2 feet distance puts in willow stakes WW, an inch in diameter, and $1\frac{1}{2}$ or 2 ft. long, sloping outwards, which take root and form a live fence, for the preservation of the quicks in the middle.—These stakes are at first bound together by a kind of eddering; at the time we saw them they had been only two years done, of course no judgment could be formed, for some years to come, whether it possessed superior advantages to the mode above-described: It appeared to us an experiment yet undetermined. In some situations, we are inclined to believe, it may be very useful, especially in cold, soft, marshy soils: Whether it will be superior in all, we still entertain some doubts; but are persuaded, that a full trial will be given, by the spirited improver who is making the experiment.—The expence is 2s. 6d. per rood of 7 yards.

Stone Walls are also used for fences in some situations; the usual dimensions are $2\frac{1}{2}$ feet at bottom, 15 or 16 inches at top, and 4 to $4\frac{1}{2}$ feet high: About half way up

a row of through-stones are put, at the rate of 9 or 10 in a rood of 7 yards, and on the top a coping of sods, or stones *set edge-ways*; the latter is preferable, as being the most lasting, and presenting a more awful aspect, to deter the Highland sheep from attempting to leap them.—The *expence* of making these walls is from 5s. 6d. to 6s. 6d. a rood of 7 yards, for *winning and walling*: The expence of leading depends on the distance.—Twelve or fourteen cart load will do a rood.

The advantages of inclosing private property in this county principally arise from separating lands of different qualities, which can, by these means, be employed in such culture, or depastured by such stock, as the occupier thinks most suitable; and, where sheep are kept, they feed with more facility and readiness, being freed from the whims of the shepherd, and the teazings of his dog; and, by separating the dry ground from the wet, a stock-master has it more in his power to avoid that fatal malady, the rot.

Gates are made of various forms, but agree nearly in size, being generally $8\frac{1}{2}$ feet wide, and from $4\frac{1}{2}$ to 5 feet high, with 5 strong bars about $3\frac{1}{2}$ inches deep, and a weaker one about 1 inch square, placed between the two lowest bars.—The lighter a gate is, especially in the forepart, the better, provided it be sufficiently strong; for this reason the top bar should be considerably stronger than the rest, as it is the most liable to be broken, especially where horses are kept, if not made so high that they cannot easily get their necks over it. The most approved form is that represented, fig. 4, pl. 5.

Hanging Gates, so as to have a proper fall or tendency to shut of themselves, being little understood by carpenters, we hope the following directions for effecting that purpose may be acceptable.

Having set the post perpendicular, let a plumb-line,
AB,

AB, be drawn upon it: on this line, at a proper height, place the hook C, so that it may project $3\frac{1}{2}$ inches from the face of the post; and at a convenient distance below this, place the lower hook D, $1\frac{1}{2}$ inches to one side of the perpendicular line, and projecting 2 inches from the face of the post; then place the top loop or eye 2 inches from the face of the "*hawtree*," and the bottom loop, $3\frac{1}{2}$ inches:—Thus hung, the gate will have a tendency to shut in every position.*

This principle has been long known and practised, in hanging gates that open both ways.

CHAPTER VII.

ARABLE LAND.

SECT. 1.—*Tillage.*

THE arable lands of this county being under various systems, and directed by various opinions, the management of the tillage must differ considerably.—In the operation of ploughing, it is generally agreed that the breadth of the furrow should be about 9 inches, and the depth from 4 to 6 or 7 inches.

It was formerly the general practice not to plough the lands intended for fallow till after Spring seed-time, (and very often delayed till May, or even June) but now the fallows are ploughed before Winter, to meliorate by the frost.—In the middle of April or beginning of May, those that are intended for *turnips* or *potatoes* are harrow-

* For if the weight of the gate be represented by the line CD, fig. 5, pl. 5, this, by the resolution of forces, is resolvable into other two, CE and DE, the former representing that part of the weight which presses in a perpendicular position; and the latter, that part of the weight which presses in a horizontal direction, and gives the gate a tendency to shut.

ed and ploughed *across*, and, where necessary, rolled with a heavy roller; the same operations are repeated two, or three, or more times, until it is thought sufficiently fine and clean for sowing or planting.

Those that are intended to be naked fallow for wheat, receive three, four, or five ploughings through the Summer; but are seldom harrowed, it being thought an advantage to wheat to have the land cloddy.

On those fallows where quickens or couch grass, &c. are found, every exertion is used to extirpate them, by harrowing, gathering and burning, or leading off, so long as the smallest remains are visible. The lime and manure are mostly laid on before the last ploughing.

For barley, it is the general custom to plough only once; but the best cultivators seldom sow this grain without giving two or three ploughings, especially when the land is to be sown with clover and grass seeds.

Every other species of grain is sown after one ploughing, except when beans or pease are to be drilled.

Trench Ploughing, is practised by a few; it is an excellent mode for breaking up grass lands, and is performed by two ploughs following each other in the same furrow; the first plough paring off the surface, from 1 to 1½ inches thick, and turning it into the bottom of the last-made furrow: While the second plough, going 3 or 4 inches deeper, turns upon it a sod of friable earth, which being destitute of tough fibrous roots, harrows to a fine mould with little difficulty.

This practice entirely obviates the objections to drilling upon clover lea, and the additional expence will not be more than 4s. per acre, which, put in competition with the advantages to be derived from it, will leave a considerable balance in favour of the practice: in breaking up old swards, on clayey lands, the expence is almost saved in the harrowing; on such soils it will be found of great

service.

service, if they are *thus ploughed* in Autumn, they may be easily drilled with beans or pease in the Spring, and the subsequent hoeings performed with facility; operations that would be very difficult to perform, when ploughed in the manner usually practised.

The Ridges are of various forms and sizes.—On the deep soiled lands, that were used as arable some centuries since, the ridges are mostly very high, broad, and crooked; * upon lands that have been lately brought into cultivation, they are straight, nearly flat, and in general about twelve or fifteen feet broad; on dry lands, they are quite flat, and alternately gathered and split. A breadth of fifteen feet answers best for sowing broad-cast at two casts.

A few years since, the ploughing, and various other purposes, for which draughts are wanted upon a farm, were performed by horses, which in ploughing or harrowing are always yoked double, and driven with cords by the ploughman, and in general plough an acre a day; but in the season of sowing turnips, one and a half, or even two acres, are frequently ploughed, on *fine light soils*. But since the great advance in the price of horses, oxen have been more used, especially for the purposes of ploughing, and carting *about home*.

They are harnessed both with yokes and collars. Where three or four are used, a boy is allowed to drive; when two,† the man that holds the plough drives with cords. They only plough *half a day at a time*; one half of a team being used in the forenoon, and the other in the afternoon.

* It is a dangerous experiment to attempt to level and straighten ridges of this description too suddenly; we have seen much mischief done by it.

† Two oxen are found very sufficient for ploughing light fallow lands in Summer; but for almost every other purpose, 3 or 4 are used.

SECT. 2.—*Fallowing.*

The practice of making naked fallows on all kinds of soils, once in 3 or 4 years, was general thro' this county, till the introduction of turnips; in a few years the fallows of the dry lands were covered with this valuable plant. On such other soils as were found improper for this root, the naked fallows still prevail, with an almost universal opinion, that it is absolutely necessary to the fertility of the land; yet there are some few who dare to doubt this long-established doctrine, and presume to think, that naked fallows might be dispensed with in *many situations*, by cultivating leguminous crops, *drilled at wide intervals*, to admit being *ploughed*, or *horse-hoed* between: to which, if *proper hand-hoeings* be added, the land will be as well prepared for wheat, as if it had been a compleat naked fallow.

This is not advanced on speculation or theory; instances can be produced, where no naked fallows have been made on fields of strong loam for 12 years, yet they are as clear of quickens, couch-grass, or other pernicious weeds, as any fields in the district, that have been under naked fallow two or three times in the same period.*

Whether fallowing is or is not necessary, has been much agitated of late years; so much so, that the different partisans have obtained the appellation of "*fallowists*," and "*antifallowists*:" It happens to be one of those subjects which can never be determined by reasoning, opinions, or bold assertions; *fair experiments* only can resolve it; and whatever may be the results of such ex-

* It may be necessary to observe, that, previous to the adoption of this system, the land was cleared of quicken, or couch-grass, by a complete summer fallowing.

periments,

periments, it may be justly concluded, they will be the same in similar soils, climates, and situations.

Tho' we are diffident in giving a decided opinion upon so important a subject, yet from observations made on the above facts, we cannot help being inclined to think, that the quantity of naked fallow might be very much reduced, and in another century will probably be totally abolished, if no fortuitous circumstances arise to check the exertions and spirit for improvement, which have been so prevalent of late years, and so generally diffused thro' this district.

SECT. 3.—*Rotation of Crops.*

The most prevailing rotation was, 1 fallow
2 wheat
3 oats
4 fallow, &c.

repeated for two, three, or four fallowings:—Upon the strong lands along the sea-coast, instead of oats after wheat, they generally substitute pease or beans, or beans and pease mixed; when laid down to grass, it is sown with grass seeds, and continued in grass seven or more years.

On dry soils, after ploughing out from grass, the rotation was, 1 Oats

2 Oats

3 Turnips, sown broad-cast, limed and dunged and twice hand-hoed.

4 Barley or wheat, sown up with clover and ray-grass, and continued in grass from four to seven, or more years, depastured principally with *sheep*.

The *best cultivators* use the following rotations, according to soil, situation, and circumstances.

Clayey soils. 1 Fallow

2 Wheat

3 Clover for 1 or 2 years, depastured with *sheep*.

sheep.

4 Beans or pease.

Strong loams. 1 Turnips, drilled at 30 inches intervals.

2 Barley

3, 4, Clover and grass seeds; for 2 or 3 years, depastured with sheep, and a small proportion of cattle.

5 Oats

6 Beans, or pease, drilled at 30 ins. intervals, horse and hand-hoed.

7 Wheat, drilled from 9 to 12 ins. intervals, horse and hand-hoed.

Sandy and dry light loams,—after being ploughed out from grass,

1 Oats.

2 Turnips, drilled at 30 ins. intervals.

3 Barley or wheat, drilled from 9 to 12 ins. intervals, hoed and sown up with clover and grass-seeds, depastured with sheep, (and a small proportion of cattle) for *three or more years*.

This last rotation has been practised of late years, and is becoming more general, not only upon the turnip soils, but upon the strong clayey lands, substituting naked fallows, or beans drilled at 30 ins. intervals, instead of turnips; and those who have tried it on such strong lands, find, that after two or three years clover and grass seeds, depastured with sheep, the land will grow good crops of oats, which they could never get it to do under their old system.

Those who have practised the Norfolk system on thin light soils, find their crops grow worse, especially the turnips and clover, and many have been obliged to adopt this system, by which they find their lands renovated; and

and, instead of having to complain, that their soil was "tired of turnips and clover," they now find, that it produces abundant crops, and that every rotation brings it nearer its former fertility.

SECT. 4.—Crops commonly cultivated.

WHEAT.

The preparation, for the greatest quantity of wheat raised in this county, is naked summer fallow:—Of late years considerable quantities have been grown after turnips; it is also grown after rape, clover, beans, pease, tares, and potatoes.

The kinds of wheat grown here include many varieties, and as they are known by different names in different districts, we are afraid, that by barely mentioning their names, a very different variety may be taken for the one we mean; and tho' we despair of pointing out such marked distinctions as accurately to distinguish them in all cases, the shades of difference being often very small, yet we hope there are some leading features which may help us to attempt an arrangement, and in some measure better enable our readers to ascertain the variety intended; for this purpose we shall divide them into two orders; viz. the *smooth chaffed*, and the *downy chaffed*, of which we shall enumerate the principal varieties now grown in this district.*

I. Smooth chaffed: *with a few short awns towards the top of the ear.*

Zealand—ears long and large, spicula very wide set, 9 in $3\frac{1}{2}$ inches, chaff white, sometimes with a tinge of brown,

* We could wish to see this subject undertaken by Professor Martin, who is well qualified to do it justice.

opening and shewing the grain; straw very long, grain white and large.

White-Kent—ears middle sized, 9 spicula in $3\frac{1}{4}$ inches, chaff white, opening and shewing the grain when ripe, straw shorter than the last, grain white.

Golden ear—ears short, spicula very close set, 9 in $2\frac{1}{2}$ inches, chaff a yellowish light brown, short; the grain white, and easily shook out by the wind.

Burwell-red—ears long and large, spicula very wide set, 9 in $3\frac{1}{2}$ inches, chaff a dark brown red, large and closed on the grain, straw long, grain red.*

II. Downy chaffed: *with a few short awns towards the top of the ear.*

Woolly-ear—ears middle sized, spicula close set, 9 in 3 inches, chaff white, closed on the grain, straw long, grain white.

Velvet ear, or little wheat—ears small, spicula close set, 8 in $2\frac{1}{4}$ inches, chaff white, closed on the grain, straw short, grain white, smaller, shorter, and plumper than the last;† and the appearance of the ear is less in every dimension.

The downy chaffed wheats have shorter straw, and are less liable to have the grain shaken out by winds (the chaff embracing the grain more closely,) than the smooth chaffed tribes, which is a considerable advantage; but then we are apprehensive that this downiness makes them retain the dews and moisture upon the ear much longer

* This variety has been much used of late years, especially upon crude or newly broke up lands, with great success, and has in a manner superseded the common red wheat.

† The form of the grain of this variety is the most perfect of any other we have seen, and from the shortness of the straw, it is the best adapted to sow upon rich soils, where there is a danger of the crop lodging.

than

than the smooth chaffed kinds, and probably renders them much more liable to be affected by those diseases which give a dusky dark shade to the chaff, and a rusty cankering upon the straw; as we recollect few instances of smooth chaffed or red wheat being troubled with this disease, of course the downy chaffed kinds are most proper for windy open situations, and the smooth chaffed to well sheltered inclosed districts.

The seed is selected with great attention from the most perfect samples, and the practice of changing seed is thought advantageous; for this purpose more or less new seed is every year imported from distant parts, as Kent, Essex, Huntingdonshire, Cambridgeshire, &c.—New seed is preferred to old, and that immediately after being threshed, rather than what has lain long in a granary.

Steeping in chamberlye, and powdering with quick lime immediately after, to make it sufficiently dry for sowing, is generally practised; the smut is seldom seen where this is properly performed,* and some go so far as to say, that it will cure smutty seed;†—it is done by throwing the

F 2

wheat

* In a practice of 40 years, the Messrs Culley have only had one instance of smut in their crops of wheat, and this was where the seed had not been steeped; and for a number of years they have not grown less than from four hundred to six hundred acres yearly.

† A field at Chillingham was sown in 1795 with wheat, in which were a few balls of smut; one-third of the seed was steeped in chamberlye and limed; one-third steeped in chamberlye, dried and not limed; the remainder was sown without either steeping or liming, in the harvest of 1796; the whole had a few straggling heads of smut, but appeared to be most in that which was unsteeped.—Mr Thompson, of Chillingham Barns, made a similar experiment, and had smut equally alike in the pickled and unpickled, but the *bead ridges* were considerably the worst; from hence it appears that steeping in chamberlye is not a preventive in all cases.—It may be proper to remark, that there are more complaints of smut this year, than any other we remember; in some places even barley was very much affected.—We believe, that on examination, the stamina will always be found adhering to the balls
of

wheat into a vessel full of chamberlye, stirring it about with a strong stick, and skimming off the light grains as they appear on the surface; when this is done, the liquor is let off, (by a plug or cock at the bottom of the vessel) and the wheat taken out and mixed with quick lime; after this, the sooner it is sown the better, because it is apt to heat and spoil if suffered to continue in the sacks, or in large heaps; but if dried and spread thin on a granary floor, will keep several days.

If the grain remains too long in very putrid chamberlye, its vegetative powers will be injured; 5 or 10 minutes are as long as it should be suffered to continue.

The quantity sown, is from two to three bushels per acre *broad-cast*, according to times of sowing, nature and condition of the land, &c.—Those who drill at 10 or 12 inch intervals, find $1\frac{1}{2}$ bush. per acre amply sufficient.

The time of sowing, on the lands that receive a naked summer fallow, is September and October; after *drilled beans*, October and November; and after *turnips*, all thro' the winter, (as the land is cleared, and weather suitable,) until the middle of March.—In the year 1795, many hundred acres were sown in Glendale Ward so late as *the beginning of April*, which was all well harvested, and produced, on an average, about 24 bush. per acre, of excellent grain; in many cases superior to that sown in the autumn: which was rather singular, as it is generally expected that wheat sown so late does not produce the grain so well perfected, as that which is sown earlier.—This lateness of sowing was occasioned by the snow lying so late in the spring.—And we are disposed to think, from

of smut, from which a suspicion arises, that the cause may be owing to some defect in those parts, probably from injuries received by insects, weather, &c. as we frequently find the same ear bearing the most perfect grains along with grains of smut.—The same experiment was repeated in 1796, and intended to be continued for some years.

many

many experiments, that on those light soils, the month of February is the best and safest seed-time for wheat, maslin, and rye, of all others in the year.

For spring sowing, the golden ear, and the Burwell-red wheats, are preferred to all others; except where the land is in such high condition as to endanger the crop lodging; then the velvet ear is used, as not being so apt to lodge, from the shortness of the straw.*—The *Triticum Æstivum*, (Siberian wheat,) or spring-wheat, was introduced and strongly recommended about twenty years since; but wherever we have seen it tried, the crops have been uncertain, and produce small: and tho' this flinty kind will ripen, if sown even as late as April, or beginning of May, yet it has not been able to maintain a struggle with the varieties above specified, and is now totally given up.

The culture whilst growing, of the broad-cast crops, consists only in hand-weeding:—Such as are drilled, are hoed once or twice, as well as hand-weeded where wanted. These hoeings not only destroy the weeds, but make a fine preparation for the clover and grass seeds; which seldom fail where this operation is properly performed.

For drilling,—we find that ridges of 78 inches wide, are the most convenient; on these we drill 6 or 8 rows, the horse going in the furrow; 3 or 4 rows are deposited on each side; and being afterwards deeply water-furrowed, the land is kept much drier through the Winter, than when in broader ridges; a matter of considerable importance to a wheat crop on moist soils.

* In February 1792 a field of 5 acres was sown (after turnips) with wheat: a part with *Zealand*, the remainder with *Velvet-ear*; the produce from the *Zealand* was 60 bushels per acre, the *Velvet-ear* 48 bushels, but the latter was injured by a blight, which was attributed to the moisture hanging longer on the chaff of the *Velvet-ear*, than on the other; from which it appears, that even *Zealand* wheat may be sown in the spring with advantage; the grain was as well perfected, as heavy, and sold for as high a price, as any shewn in the market that season.

The produce varies considerably, according to soils, seasons; culture, &c. from 24 to 30 bush. per acre may be taken as a fair average crop, under favourable circumstances, as high as 50 and even 60 bush. per acre sometimes occur.

The manufacture of wheat into flour for exportation, is principally carried on at Alenmouth, Waren, and a few mills near Berwick; what is done in the vicinity of Newcastle and other places is principally for home consumption.

RYE

Was formerly the principal grain grown upon all the dry, sandy, and light soils; but since the use of lime, and the introduction of turnips and artificial grasses, it is rarely cultivated, except upon *very sandy* soils;* it is sown after turnips or clover, from September all through the winter, till the beginning of April.

The quantity sown is about two bushels per acre.

The produce from twenty to thirty bushels per acre.

Upon lands intended for turnips next summer, it is frequently sown in August and September, along with rape, as spring feed for sheep, which often proves very valuable in the month of April.

Manufacture.—The principal part of the rye grown in this district, as well as considerable quantities imported from abroad, is consumed in the southern parts of the county, it being the most general bread of the labouring people in that quarter:—After being leavened, until it gains a considerable degree of acidity, it is made into loaves, and baked in a large brick oven, or made into

* The soils which formerly were occupied in growing rye are now so much consolidated and improved by the use of lime, that they produce abundant crops of excellent wheat; several thousand acres of which are now grown every year after turnips, where thirty years since, scarce a single bushel was ever produced.

thick cakes, $1\frac{1}{2}$ or 2 inches thick, called "sour cakes," and baked on the girdle:—The bread is very firm and solid, dark coloured, and retains its moisture or juciness longer than any other bread we know.

MASLIN

(That is wheat and rye mixed) is sown in some parts of the county; the preparation, quantity sown, and produce, are much the same as wheat; its application is for household bread, for which purpose many people think it superior to wheat alone, especially when the proportion of rye is betwixt $\frac{1}{2}$ and $\frac{1}{3}$ of the whole.

It has been remarked, that when wheat and rye are grown mixed in this manner, the grains of each are larger and more perfect than when grown singly, without any admixture.

BARLEY

Is generally sown after turnips:—In Glendale Ward a few farmers cultivate it in drills, with 9 or 12 inch intervals.

The kinds most commonly cultivated are,

1st. *The common long ear'd barley*, which being early, productive, and best liked by the maltsters, is by far the most prevalent.—This variety is distinguished from the next by the skin having a light red or purplish tinge a little before it is ripe, and being marked with 7 dark red lines, running longitudinally along the back of the grain, and may be called the *red stroked*, or *dark skinned barley*.

2^d. *A variety of the long ear'd barley*, the awns of which drop, or are easily shaken off when ripe; from the grain being shorter, plumper, and rounder bodied than the common sort, it is preferred by the millers for making into pearl barley.—This variety ripens later than the com-

mon kind, or red stroked barley, by near a fortnight, and is distinguished from it by the grains being closer set, and the skin having a light yellowish tinge, and not being marked by dark red lines; - it is also shorter in the straw, and may be called the *yellow*, or *pale-skinned* long-ear'd barley.

3d. *Battle-door*, or *sprat-barley*, is sometimes grown, and is preferred, for sowing upon land in high condition, where there is a danger of the other kinds lodging; it is about three weeks later of ripening than the common kind.

4th. *Bear*, *bigg*, or *four-rowed barley*, used to be the only species of barley cultivated in the county:—It is now rarely sown, except upon raw, crude soils, on which it is found to answer better than any other, more especially if late sown, owing to the turnips having been kept longer than usual in a cold backward spring, for the use of the feeding, and store stock.

The quantity sown is from 2 to 3 bushels per acre broadcast; when drilled at 9 to 12 inch intervals, it is found that from $1\frac{1}{2}$ to 2 bushels per acre is sufficient.

The time of sowing, from the beginning of April to the latter end of May.

The produce, from 30 to 60 bush. per acre.

Manufacture.—Great quantities are made into *pot* or *shelled barley*, not only for home consumption, but for exportation: In the northern parts of the county very few corn mills are now to be found without the appendage of a barley mill.

Barley, or barley mixed with grey pease or beans, is the common bread of labouring people in the northern parts of this county; previous to grinding they are mixed in the proportion of two parts barley, and one of pease or beans; after being ground the meal is sifted thro' a fine

fine sieve, made of wood, to take out the rough husks and coarse bran; it is then kneaded with water, made into thin *unleavened cakes*, and immediately baked on a girdle over the fire.

In this district, barley or mixed meal, is seldom, if ever, *leavened and baked in loaves*.

OATS

Are universally grown throughout every part of the county; they are sown after every species of grain, as well as grass or clover lea.

The varieties, usually cultivated, are,

1st. *Poland oat*—a variety of which, called *Church's oat*, from the name of the person* who first introduced them, are now in high estimation, and are the best early oat yet known for sowing upon loamy lands in good condition; they are early, very productive, and much liked by the millers, who give two-pence per bushel more for them than the common oat. This variety is known by the grains being remarkably short, large, plump, round, and well filled, and not in the least tailed: a bushel generally weighs 46 lb.

2d. *The Dutch, Friesland, or Holland Oat*—were almost the only species of early oats grown here, before the introduction of the Church oat; they are now only grown upon dry, light lands, to which they are better adapted than the Poland oat.

3d. *Peebles Oat*.†—A variety of common oat, but much

* Mr Church first had them from Mr James Robson, apprentice of Messrs Culley, who brought them out of Scotland, and gave Mr Church a handful; those he brought to Fenton were lost.

† In some places it is called the red oat, probably from its being not so fair as the common oat; but it is very different from the red oat grown in the midland counties, and ought not to be called by the same name: For this reason we call it Peebles Oat.

earlier, has been lately introduced from Peebles shire, in Scotland; it is a very proper oat for hilly districts, not only for its earliness, but in not being easily shaken by the wind: The grains are the smallest of any other oat we know; but from the very thin skin, it meals well, and is liked by the millers, and ripens nearly as early as the dutch oat.

*4th. Common Oat**— is grown upon all such lands as are not thought in sufficient condition for the Poland or Dutch kind.

5th. Angus Oat.—A variety of common oat has been introduced of late years from Angus-shire; it is a better bodied grain than the common oat; produces more straw, and answers very well in early situations. But its being later in ripening than the common oat, will militate against its general adoption, in a country where early harvests are so desirable. This oat answers beyond every other, in poor, dry, rabbit warren soils, from its throwing up so much straw; and on such soils ripens early enough.

6th. Tartarian Oats,—after several trials, by different people, about 20 years since, were given up, on account of the inferiority of the grain, and the strong reedy straw being of little value for fodder: We now find them cultivated in the midland parts of the county, on rather an extensive scale, being found there more productive than any other kind they have tried; they speak of some crops being as high as 80 bushels an acre; but we suspect these are under peculiarly favourable circumstances, as we find that in comparison with Angus oats, both grown in the same field, in the year 1795, they produced no more than 40 bushels per acre, tho' estimated (by a strong advocate for them) at near double that quantity; the Angus oats

* The best seed of this kind of oat is got from Blainsley, in Scotland.

were more productive per acre, and worth more to the millers by 3d. per bushel.

7th. *Black Oats*—are seldom grown in this district; we do not remember seeing them more than three or four times, and then only by way of experiment.

In point of earliness, they succeed each other, as classed above; the Angus oat being at least three or four weeks later than the Poland and Dutch.

The quantity sown in general, is seven bushels per acre of the Poland, and six of the Dutch oats: These quantities are necessary, as they do not tiller much, and are large bodied grain; but for the other kinds, we think four or five bushels sufficient.

The time of sowing,—is March or April, and the early kinds are sown sometimes as late as the middle of May.

The produce of common oats is from twenty to forty bushels per acre; of the Poland and Dutch, from forty to sixty. There are some instances of seventy or eighty bushels per acre, but these were generally attended with some favourable circumstances.*

On fresh land, and crude moory soils, oats are probably the most profitable crop that can be sown; old worn-out tillage, and strong clay land, are improper for producing this grain; it being found, that in such situations, they are scarce worth cultivating; such soils are much better adapted to the culture of wheat, pease, beans, vetches, and other leguminous crops.

The Manufacture of Oat-meal, is carried on to a considerable extent, both for exportation and home consumption; oat-meal being a principal article of food with the great mass of inhabitants, not as bread, but in *crowdies*, or

* We have been informed by a principal corn merchant in Berwick, that the oats grown in Glendale, are sold in the London market, for 1s. 6d. per quarter more than any other oats presented there.

hasty-pudding, (provincially "*meal kail*,") for breakfast and supper; the former is made by pouring boiling water upon the oat-meal, and stirring it in with a stick, or spoon shank, till it be so very stiff, that the stirring implement can with difficulty be got round; it is then eaten with butter or milk: this is the breakfast of many of the labouring people, especially in the southern parts of the county; and with which they reckon they can work longer hours, than with hasty-pudding, or a breakfast of bread and milk.

Hasty-Pudding is made by putting oat-meal gradually into boiling water, and stirring it about with a peeled stick ("*thivel*") and letting it continue to boil in that thickened state, until sufficiently enough, when it is taken off the fire, and poured out of the pan into pots or dishes to cool, and then eaten with butter, or more commonly skimmed milk; it is an agreeable, nutritive, and healthy food, and is the general breakfast and supper of the labouring people in the northern parts of the county.

BEANS

Have, time immemorial, been a prevailing crop upon all the strong lands in the county, especially along the *sea coast* to the southward: they generally succeed wheat, clover, or old grass.—*The kinds cultivated*, are the large and the small horse bean, and sometimes the mazagan; they are sown in February, four bushels and a half per acre *broad cast*, and never hoed: The produce very uncertain; 20 bushels per acre a fair average *broad-cast* crop.

In this district, the soil of which is so well adapted to the growth of beans, it is surprising that drilling them should be totally neglected, and that this beneficial mode of culture for both beans and pease, should be confined to

a few farmers in Glendale Ward and Tweed-Side: With these few they are drilled from 30 to 34 inches distance; *horse-hoed* or *ploughed between*, and *hand-hoed*; the crops good, and the wheat that succeeds, equal to that upon the summer fallows adjoining. We find that two or three ploughings, or horse-hoeings between the rows, and twice hand-hoeing in the rows, are generally sufficient.

The first horse-hoeing, or ploughing, takes the earth from the rows, and the second turns it back again to earth up the beans which are then in full bloom, and from 24 to 30 inches high. If the land be so very hard, that a plough cannot penetrate it, the horse-hoe, described page 41, must be first used.

Where beans are intended to be drilled, we plough the land in Autumn, immediately after the corn is off; gathering each ridge, and harrowing it lengthways; then set it up in one-bout ridges at 30 inches distance; and if the land be in *broad high ridges*, directly *across the ridges*, water furrowing after the whole is done, and opening the hollow intervals into the water furrows; this keeps the land dry, and exposes the greatest quantity of surface to the influence of the atmosphere, and amelioration of frosts.

If any dung or manure be intended for the fallow, we put it in the hollow intervals, and cover it by splitting the one-bout ridges with the plough, and drawing a harrow once over, in the direction of the one-bout ridges; the beans are then drilled upon them, by the drill plough, *fig. 5. pl. 1.**

Where

* A field that in the usual rotation would have been naked fallow, was thus prepared after oats; and in February 1794, drilled at 30 inches, with large horse beans, 2 bushels per acre, the produce 42; in November, it was drilled with wheat, 14 bushels per acre, at 9 inch intervals, which was reaped in September following, the produce 36 bushels per acre; in 1796, another field was drilled with beans at 32 inch intervals, the produce

Where the land is level, it may be ploughed into ridges of 66 or 78 inches wide; on the former (with the large drill, *fig. 2. pl. 3.*) we drill two rows of beans, and on the latter three: In the first case the horse goes *in the furrow*, and the machine drills a row on each side of it, the distance of the rows 33 inches; in the latter case the horse may go *on the top* of the ridge, or, what is better, two horses may be yoked to it, so that one may go in each furrow.

PEASE

Were formerly a more general crop than at present; they are mostly grown upon such lands as have been worn out by running too long in ploughing.* The early and late grey pea are the only kinds cultivated here; the latter is usually sown in February or March, and the former in April: three bushels is the quantity sown per acre, broad cast; and the quantity reaped depends very much on seasons; no grain being so uncertain a crop as pease. A good crop is reckoned at twenty-five to thirty bushels per acre. They are also cultivated in drills, from 12 to 18 inch intervals, and horse and hand-hoed.

Spring Tares—are grown principally for cutting, as green food for horses, to supply the vacancy between the first and second cutting of red clover, used for the same purpose and for the same intention.

produce 45 bushels per acre; and in November drilled with wheat, at 12 inch intervals: The crop in July 1797, is promising to be at least 41 bushels per acre; and both fields are as clean, or clear of quickens, or other weeds, as any lands in the county, that were naked fallow: One of them has been under this system for upwards of ten years.

* On such old tillage lands, it is found that wheat, pease, vetches, or tares, are the only species of grain that can be raised to advantage.

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Winter

Winter Tares—have been lately introduced, and promise to answer well; both kinds are grown upon the fallow lands, intended for wheat or late turnips:—The winter tares are sown in September, and the other in March.

POTATOES.

Of this invaluable root, the varieties cultivated here are very numerous, and frequently changing; many of the kinds that were formerly in repute, being now in a manner lost; as the *true kidney*, the *rough white*, the *blood red*, the *tawny*, &c; and their places supplied by others.

For the Table, the sorts most in repute at present, are three or four different kinds of long whites; one of which having a red end, is called *red-snout*, or *red-neb*; and several sorts of round whites, and the *pink-eye*, or red streak, which is a late potatoe, and the best for eating in the spring, of any we know;—it is frequently used till the beginning of July.

For Stock, the principal kinds used are, the *champion* and the *black-a-moor*, or *black-potatoe*.

They are generally cultivated in drills, from 32 to 40 inches distance; whole potatoes are seldom or never used for sets, but cut into pieces, containing one or two sprouts or eyes. These are planted about 12 inches distance, in the bottom of the drill, the dung laid upon them, and the soil turned upon the whole, by the plough splitting the one-bout ridges. They are kept clean by hand-hoeing, and ploughing between the drills; and as the stems advance in height, they are earthed up by a common, or double mould board plough, with which implements they are frequently taken up, by splitting the drills in which they grow, and the roots gathered by women and children.

They

They are seldom grown for the use of stock, except for horses, to which they are given raw,* after the rate of two pecks per day each horse, and found very useful in the spring, (when the straw and hay become dry) and are serviceable for preventing grease or other disorders, by keeping the horses cool and open: They are sometimes given to cattle and sheep in the spring, when a scarcity of turnips prevails.

The mode of preserving them thro' the winter, is by laying them in heaps, upon a piece of dry ground, and covering them with straw 6 or 8 inches thick, and over the straw another cover of soil about a foot thick; which soil is got by making a ditch from 12 to 18 inches deep round the heap: A bed of straw should be laid at the bottom.

TURNIPS

Have not been used in this county as food for supporting cattle and sheep, much above seventy years;† for this purpose they were first grown in the northern parts of the county; it is but of late years they have been cultivated on part of Tyne-side.

The varieties,—are the Green Top, the Red Top, and the White Top; which last, is by far the most general

* The practice of preparing potatoes by steam, has not yet taken place in this county; we believe it would be a material improvement.

† Mr Edward Nisbet, who is now near 90 years of age, says, that it is upwards of 70 years since Mr Proctor, the proprietor of Rock, brought Andrew Willey, a gardener, to cultivate turnips at Rock, for the purpose of feeding cattle; that Willey afterwards settled at Leshbury as a gardener, and was employed for many years to sow turnips for all the neighbourhood, and his business this way was so great, he was obliged to ride and sow, that he might dispatch the greater quantity: The practice of hoeing was also introduced at this time.

and

and in the greatest répute, being superior to the others in size and sweetness.

There is a small hard, white kind, preferred by some on account (it is said) of standing the winter better than most others, but it does not grow near so large a quantity upon an acre.

At their first introduction they were sown broad-cast, and hoed by gardeners and other men, at extravagant wages. The late ingenious Mr Liderton, about twenty-seven years since, had the merit of first reducing the price of hoeing, by teaching boys, girls, and women, to perform the work equally as well, if not better, than men. The mode he took was simple and ingenious. By a light plough, without a mould-board, he divided the field into small squares of equal magnitude, and directed the boys and girls to leave a certain number of plants in each square. In a short time they became accurate, regular, and expert hoers; and in a few years all the turnips of the country were hoed by women and boys, at half the expence, and better than by men.

The present mode of drilling turnips was first introduced into this county about the year 1780; the advantages with which it is attended have so far recommended the practice, that very few are now sown broad-cast;* and as we think it is an operation that may be serviceable in other districts, we shall be more particular in describing the manner of performing it.

The land being made fine, prepared, &c. as in the broad-cast method, the ploughman draws his first furrow as straight as possible. In returning he keeps his far side

* The broad-cast culture of turnips in the northern parts of the county, for many years previous to this, was not inferior to any we ever saw; and in respect to accurate, regular, clean hoeing, superior to what we ever observed in Norfolk, Suffolk, or other turnip districts, which we have frequently examined.

They are seldom grown for the use of stock, except for horses, to which they are given raw,* after the rate of two pecks per day each horse, and found very useful in the spring, (when the straw and hay become dry) and are serviceable for preventing grease or other disorders, by keeping the horses cool and open: They are sometimes given to cattle and sheep in the spring, when a scarcity of turnips prevails.

The mode of preserving them thro' the winter, is by laying them in heaps, upon a piece of dry ground, and covering them with straw 6 or 8 inches thick, and over the straw another cover of soil about a foot thick; which soil is got by making a ditch from 12 to 18 inches deep round the heap: A bed of straw should be laid at the bottom.

TURNIPS

Have not been used in this county as food for supporting cattle and sheep, much above seventy years;† for this purpose they were first grown in the northern parts of the county; it is but of late years they have been cultivated on part of Tyne-side.

The varieties,—are the Green Top, the Red Top, and the White Top; which last, is by far the most general

* The practice of preparing potatoes by steam, has not yet taken place in this county; we believe it would be a material improvement.

† Mr Edward Nisbet, who is now near 90 years of age, says, that it is upwards of 70 years since Mr Proctor, the proprietor of Rock, brought Andrew Willey, a gardener, to cultivate turnips at Rock, for the purpose of feeding cattle; that Willey afterwards settled at Lesbury as a gardener, and was employed for many years to sow turnips for all the neighbourhood, and his business this way was so great, he was obliged to ride and sow, that he might dispatch the greater quantity: The practice of hoeing was also introduced at this time.

and

and in the greatest repute, being superior to the others in size and sweetness.

There is a small hard white kind, preferred by some on account (it is said) of standing the winter better than most others, but it does not grow near so large a quantity upon an acre.

At their first introduction they were sown broad-cast, and hoed by gardeners and other men, at extravagant wages. The late ingenious Mr Hiderton, about twenty-seven years since, had the merit of first reducing the price of hoeing, by teaching boys, girls, and women, to perform the work equally as well, if not better, than men. The mode he took was simple and ingenious: By a light plough, without a mould-board, he divided the field into small squares of equal magnitude, and directed the boys and girls to leave a certain number of plants in each square. In a short time they became accurate, regular, and expert hoers; and in a few years all the turnips of the country were hoed by women and boys, at half the expence, and better than by men.

The present mode of drilling turnips was first introduced into this county about the year 1780; the advantages with which it is attended have so far recommended the practice, that very few are now sown broad-cast;* and as we think it is an operation that may be serviceable in other districts, we shall be more particular in describing the manner of performing it.

The land being made fine, prepared, &c. as in the broad-cast method, the ploughman draws his first furrow as straight as possible. In returning he keeps his far side

* The broad-cast culture of turnips in the northern parts of the county, for many years previous to this, was not inferior to any we ever saw; and in respect to accurate, regular, clean hoeing, superior to what we ever observed in Norfolk, Suffolk, or other turnip districts, which we have frequently examined.

horse in the new made furrow, and his plough at such a distance as to form a one-bout ridge like Δ ; by proceeding in this manner, the land, when finished, will appear thus: $\Delta\Delta\Delta\Delta\Delta\Delta\Delta\Delta$. The distance of these little ridges is from twenty-seven to thirty inches. A less distance does not admit of ploughing between the drills.

The next operation is spreading the dung; which is performed by a cart going down every third or fifth furrow, and laying the dung in small heaps; women and boys follow with small three-pronged forks, and spread it evenly in the bottom of three or five furrows, that is, the one where the dung is dropped from the cart, and those on each side of it: this done, the ploughman splits the one-bout ridges before raised, and covers up the dung exactly in the middle; but before the seed can be sown, these last formed one-bout ridges require to be flattened at the top, by a small roller that flattens two ridges at once. Upon the top, and exactly in the middle of these flattened ridges, the seed is deposited by one or two drill machines, tied to the roller by a rope six or seven feet long; at which distance they follow the roller, each machine being guided by a man.* When finished, the work appears in this form:



Where S represents the feed, and D the dung directly under it, which is wholly employed in promoting the vegetation of the turnips.

The roller is drawn by one horse, driven by a boy. Setting up the ridges, and covering in the dung, is performed by a common swing plough. The quantity of

* See fig. 3, pl. 2.

seed sown, from one to two pound per acre; it being better to have an abundance of plants, for fear of accidents. The quantity of dung used is from ten to fifteen two-horse cart-loads per acre.

When the plants have four leaves, we begin to hoe; and as they have so much room sideways, we leave them only eight or nine inches distance from one another in the rows or drills. The hoers go sideways, and pull the surplus plants, weeds, &c. into the hollow intervals between the one-bout ridges, and the turnips are left as regular as if they were planted. This work is performed by women and children, with the greatest care and exactness, at the expence of four shillings per acre.

As soon as the plants are recovered, which will be in eight or ten days, a small plough* (five inches wide at the bottom behind, and eleven inches at top) drawn by one horse, takes the earth from the turnip rows, and with the soil covers the weeds, &c. which the hoers had pulled into the hollow intervals between the ridges. A second hoeing takes place, when the plants are strong enough, and otherwise necessary; and a few days after, the soil or earth before ploughed from the turnip rows, into the hollow intervals, is now equally divided and laid up to each drill or ridge again, by the same small plough and one horse, or with a double mould-board plough.—This finishes the business, unless the land has been very wild and out of condition, and requires more hoeing and ploughing between the drills.

If the drills are made in the same directions of the ridges at the next ploughing for corn, the surface will be irregular, and the dung unequally distributed. To avoid this, on dry level lands, the drills are made diagonally across the field; but where the ridges are high, it is best

* See fig. 3, pl. 1

to make the drills *directly across* the ridges, and draw a plough down the furrows to take off the water.

It is generally supposed that a weightier crop is produced by the drill than the broad-cast method ;* but even admitting them equal in this respect, the superiority, as a fallow crop, must be allowed to the drill ; for the repeated ploughings in the intervals, and hand-hoeings in the rows, effectually extirpate the whole race of annual weeds ; and so much surface being exposed through the winter, makes a higher preparation for any succeeding crop. Another advantage is, the facility with which they are hoed, as a boy or girl, nine or ten years old, can hoe them with the greatest ease, and generally better than experienced broad-cast hoers, who are apt to take too many plants away ; while the young ones, from the apprehension of making them too thin, will leave them at any distance you shew them.

The application of turnips in this county is mostly to feeding and rearing cattle and sheep, and some small quantities for raising seed.

When used for cattle, they are always led off from where they grow, being previously cleared of the earth and fibrous roots as they are pulled, in order to keep them as clean as possible. When the cattle are tied up in sheds, which we think much better than being out in the fields, they are foddered with turnips eight or nine times a day, and with straw or hay twice ; great attention ought to be paid to keeping their cribs clean.

* Turnips drilled in this manner, were sold in 1793, for 8l. an acre, for feeding cattle and sheep, a much higher price than was given for any sown broad-cast ; and we have known instances upon thin, poor, light soils, that the crop of turnips was of more value than the fee simple of the land upon which they grew ; which we hope will remove the doubts of those who have suspected that this mode would not answer upon weak thin soils : To such soils it is certainly the best adapted of all others.

When

When the convenience of sheds cannot be had, they are given to the cattle in a dry grass field, scattered as thin as circumstances will admit: A crib with straw in it should be constantly in the field, for the cattle to serve themselves whenever they chuse.

For sheep, they are sometimes eaten upon the ground where they grow, particularly if a dry, light sandy soil, but more generally led off into an adjoining field,* which we think a much better and more economical practice; the sheep getting a daily, regular supply of fresh food, and the shells being kept clean, are eaten by young cattle, or those that are to be fattened next summer upon grass.

Sometimes every other ridge is led off, and the remainder eaten upon the ground where they grow.

When eaten upon the ground, the sheep are not turned upon the whole at once; but have it portioned out to them, by hurdles, or nets; so that they may have a fresh break once a week or ten days.

For seed, the turnips of the best form are selected and transplanted in the month of October, November, or December, into a piece of ground properly prepared to receive them; in July or August following it is generally reaped, tied up in sheaves, and when dry, put into a long stack, where it is kept through the winter, and threshed out in April or May.

The trouble of selecting and transplanting is sometimes dispensed with; but the seed raised in this manner is sold for one-half or one-third the price of the transplanted

* The fields into which the turnips are led to be eaten, are such as are intended to be ploughed up next year for wheat or oats:—Thus every field in rotation reaps the benefit of having the turnips eaten upon it, which we find much preferable to the system of eating them upon the field where they grow.

seed; that is, when the transplanted seed is sold for 1s. per lb. the other is sold for 4d. or 6d.

The produce is very variable, being subject to many casualties.—The average crop may be reckoned about 20 bushels, or half a ton per acre.—The land should be good, and well manured after the crop; as we find the soil much impoverished by it.

HISTORY

OF

DRILLED TURNIPS.

TO trace useful discoveries from their origin, through their various stages of improvement, is in most cases both useful and entertaining; and teaches us not to despair, though our first attempts may be unsuccessful; but rather hope, that by perseverance, and varying modes and circumstances, we shall at last attain the object sought for. The method of cultivating turnips, described above, is an encouraging instance of this observation:—as we find that Mr Tull first cultivated turnips at three feet distance;—for in his Essay on the Principles of Tillage and Vegetation, under the article Turnips, page 96, he says, “When I drilled upon the level* at three feet intervals, a trial was made between those turnips, and a field of the next neighbour’s, sown broad-cast at the same time, whereof

* “It is impossible to hoe-plough them so well when planted upon the level, as when they are planted upon ridges; for if we plough deep near to the row, the earth will come over on the left side of the plough, and bury the young turnips; but when they stand on ridges, the earth will almost all fall down on the right side into the furrow, in the middle of the interval.”

the

the hand-hoeing cost ten shillings per acre, and had not quite half the crop of the drilled; both being measured by the bushel, on purpose to find the difference.*

“Drilled turnips, by being no where but in the rows, may be more easily seen than those which come up at random; and may therefore be sooner singled out by the hand-hoe, which is another advantage, because the sooner † they are singled out the better they will thrive. *Page 98.*

“We need not be very exact in the number or distance ‡ we set them out at; we contrive to leave the master turnips (when there is so much difference in them) and spare such when near one another, and leave the more space before and behind them; but if there be three master turnips together, we take out the middlemost. *Page 100.*

“Dung and tillage together will always attain the necessary degree of pulverization in less time than ploughing can do alone; therefore dung is more useful for turnips, because they have commonly less time to grow than other plants. *Page 102.*

“I have had great crops of turnips in rows three feet asunder, and much greater than I could ever obtain from

* “And I have since found that turnips on the same land planted on ridges, with six foot intervals, make a crop double to those that are planted on the level, or even on ridges with three feet intervals.”

† “The sooner they are made single the better; but yet when they are not very thick, they may stand till we have the best convenience of singling them without much damage; but when they come up extraordinary thick, it will be much more difficult to make them single, if they are neglected at their very first coming into rough leaf.”

‡ “The distance need not be regular; for when a turnip has six inches of room on one side, and eighteen on the other, it is almost as well as if there was one foot on each side.”

rows thirty inches asunder. But one reason why I like six foot rows better is, that the largest turnips are best for oxen; and are pulled up and loaded with the least expence.—I find that the least competent number will (*ceteris paribus*) always be the largest. *Preface, page ix.*

“Several lands of turnips, drilled on the level of three foot rows, ploughed and doubly dunged, and also horse-hoed, did not produce near so good a crop of turnips as six foot rows adjoining, horse-hoed, though no dung had been thereon for many years.

“There was no other difference, than that the three foot rows did not admit the hoe-plough to raise half the artificial pasture as the six foot rows did. The dung ploughed into the narrow intervals before drilling, could operate no farther with any great effect, than the hoe-plough could turn it up, and help it in its pulverization.”

From these extracts it appears, that Mr Tull cultivated turnips in rows, not only on the level, but on the tops, of two and a half and three feet ridges, and both horse and hand-hoed, as at present; but whether he put dung in the bottom of those ridges is not so clear, from the expression, “the dung ploughed into the narrow intervals before drilling.” It is unfortunate that this ingenious gentleman, to support a whimsical theory, should not allow that dung was of any other use in vegetation, than in pulverizing the soil; though he is obliged to admit, that for cabbages, turnips, carrots, and potatoes, it will make the crops greater, and the cattle will like them never the worse.*

But his disciples entertained juster notions of the properties and value of dung to neglect it, as will appear in the sequel.

We are informed by a gentleman who went to direct the management of an estate in Dumfriesshire, in 1769,

that Mr Craik, of Arbigland, near Dumfries, had then drilled turnips betwixt twenty and thirty years; by taking the medium, his first beginning would be about 1745. The mode he pursued was as follows:—In the Autumn, as soon as the corn crop was off, he ploughed his land into two-bout ridges, in which state it continued all winter; next spring these ridges were ploughed, and harrowed until sufficiently pulverized, and at last split to make a hollow furrow for depositing the dung, which was covered in by the plough going twice about, making a ridge near four feet wide; then this two-bout ridge was harrowed, a single-wheel drill, turning round a hollow cylinder of tin with holes in it, deposited the seed directly over the dung: the drill had a small roller behind to cover in the seed, and was drawn by one horse. When the plants were ready for hoeing, they were set out at ten or twelve inches distance one from another, in the rows; and the intervals ploughed between through the Summer, as often as necessary.

From this place it is probable that the practice had travelled into Cumberland; for in the year 1755, Philip Howard, Esq. of Corby, first cultivated turnips in that county, in drills with four feet intervals; finding the distance too wide, he reduced it to two feet, and continued it for ten years before it was followed by the farmers, who now pursue the same mode with little variation, except that they make the distance of the intervals about twenty-seven inches. The one-bout ridges, in which the dung is deposited, are here called *stitches*, and are flattened at the top by drawing a piece of wood over them, instead of a roller or a harrow.

About the year 1756, or 1757, Mr Pringle, formerly a surgeon in the army, who had an estate near Coldstream, in Berwickshire, was the first person in that neighbourhood who cultivated turnips in this manner: His drills were

were at three feet and a half distance. Mr Cox, a serjeant, whom Mr Pringle brought home with him for a servant, says, that his master took his hints from Mr Tull's book, and that he also drilled all his corn crops, until he had overcome the annual weeds.

Mr William Dawson, who was well acquainted with the turnip culture in England, having been purposely sent to reside in those districts for six or seven years where the best cultivation was pursued, with an intention not only of seeing, but of making himself master of the manual operations, and of every minutia in the practice, was convinced of the superiority of Mr Pringle's mode over every other he had seen, either in Norfolk or elsewhere; and in 1762, when he entered to Frogden Farm, near Kelso, in Roxburghshire, he immediately adopted the practice upon a large scale, to the amount of 100 acres yearly. He began by drilling at three feet distance; but a few years after, trying various widths of intervals, he reduced it to two feet and a half, which he still continues. As far as we have been able to obtain information, he was the first that used *a roller for flattening the tops of the one-bout ridges.*

It may not be improper to remark, that Mr Pringle pursued this mode for several years, yet none of his neighbours followed the example; but no sooner did Mr Dawson (an actual farmer) adopt the same system, than it was immediately followed, not only by several farmers in his vicinity, but by those very farmers adjoining Mr Pringle, whose crops they had seen for ten or twelve years so much superior to their own. It is also deserving of notice, that when Mr Dawson settled at Frogden, the whole of that district was under the most wretched system of cultivation, and the farmers unacquainted with the value of turnips, artificial grasses, and lime. At first his practice met with many opponents, and was ridiculed by the old, the ignor-

ant, and the prejudiced; but his superior crops and profits soon made converts: The practice in a few years became general; and this district is now amongst the best cultivated in the kingdom, the land trebled in value, and the aspect of the country greatly improved. It is a pleasing reflection, that the example and exertions of one man has been capable of producing so great, so lasting, and inestimable benefits; and it is more than probable, that this mode of cultivating turnips would have died away with Mr Pringle, and the practice been lost to this district, had it not been for the discernment and intelligence of this individual.

We remember seeing, about twenty-five years since, turnips cultivated in this manner, by Mr Christopher Benson, of Stainsby, near Ripley, in Yorkshire, an ingenious gentleman, and great advocate for drilling, and who had drilled all his corn crops for many years: His nephew, Mr Donkin, informs us, that he had cultivated turnips in this manner, more than twenty years before this, which will be prior to the year 1750.

In Mr Benson's practice described by himself, in Dr Hunter's *Georgical Essays*, page 379, the seed is drilled *upon the dung*, and that and the seed covered together, by harrowing across the ridges: In this paper he very properly sums up the advantages of this mode of cultivating turnips; he observes, "the seed being placed upon the moist dung, will vegetate early in all circumstances of the weather; and the manure being well covered, will be secured from evaporation in the hottest seasons: The turnips being placed immediately over the manure, have a ready passage by means of their tap roots, into rich bed of nutriment, which will accelerate their growth, and increase their size. As the crop grows upon ridges, with a

* His nephew says "the dung and seed were covered in by a double mould-board plough set wide, and then harrowed."

trench on each side, it is obvious that the turnips will remain dry in the wettest seasons, a circumstance of the utmost utility: To those advantages we may add, the *doubling of the soil*, which I consider as an important article in all situations where the *staple of the land happens to be thin*.*

From a review of the whole it appears, that the present mode of cultivating turnips, by drilling in rows at two feet and two feet and a half distance, had occurred to different people in different parts, who all, at first, began according to Mr Tull's directions, with the addition of dung put in the bottom of the ridge; and after trying various width of intervals, found that the best and most convenient distance was from twenty-four to thirty inches; but it is very clear that *Mr Tull is the root from whence this excellent practice first originated*.

This mode of cultivating turnips, is now spreading far and wide, with great rapidity; besides this county, it is also the general practice of Roxburghshire and Berwickshire, and has been lately adopted by the best cultivators in various districts of Scotland, as well as different parts of England; amongst which the county of Norfolk will particularly profit by it, as a first-rate cultivator who holds a large farm in that county, has procured the proper apparatus from hence, and sent his son to be instructed in the different operations; it has also found its way into Dorsetshire; we had the pleasure of seeing it practised with great success by the ingenious Mr Boswell of Piddletown; and to the farmers of Devonshire, it has been particularly recommended, as the best system known, by the celebrated Mr Marshall, who has minutely examined, and is well acquainted with the agriculture of the greatest part of the kingdom.*—And the President of the Board adds,

* This Gentleman has published the Rural Economy of Norfolk, Yorkshire, Midland Counties, Gloucestershire, the West of England, &c.

that

that this gentleman informed him, that the best cultivators, and most intelligent farmers he had ever seen, were those who practised this system on Tweed-side.

SECT. 5.—*Crops not commonly cultivated.*

Ruta Baga—has been tried by a few; but not so long as is necessary to draw any positive conclusions respecting its comparative merits. With us, it is not near so valuable as the common turnip. Hares are remarkably fond of it, and will not touch the other turnips while there is one of these in the field.

Rape—is seldom grown for seed, and perhaps not so often for sheep as it ought, on lands improper for turnips. Upon lands that have grown early oats, and are intended for fallow next year, it is sometimes sown in September, as spring seed for sheep, to supply the vacancy between turnips and clover. For this purpose a little rye is sown along with it.

Cabbages—were cultivated, but gave way again to turnips; it being thought that the latter answer as good a purpose, and are obtained with less trouble.

Carrots—have been frequently tried; but have hitherto made little or no progress, probably from the great trouble attending their cultivation, compared with potatoes; which in some measure answer the same intention as food for horses.

Flax—was formerly cultivated in small quantities for family use, but is now in a great measure given up; it having been found, that land which had grown flax was so much impoverished, as to require an extra manuring, before it could be brought to the same state of fertility as the rest of the field.

Woad, (Isatis Tinctoria.)—This plant, the leaves of which

which are so useful in dying,* is cultivated at *Newburn* only, on the banks of the Tyne, by Messrs Rait, Pollock, and Dun.

The ground is ploughed with a deep furrow before Winter, and made as fine as possible against April, in which month it is sown, at the rate of 6 bushels per acre, broad-cast; in about a fortnight after it makes its appearance above ground, particular care is taken to keep it clear of weeds, which is done by boys and girls from 10 to 14 years of age;† who have each a spade about 5 inches long and 4 inches broad, which they use with one hand to dig up the weeds, and with the other gather them; this process is repeated two or three times before cropping; which is done by wringing off the leaves of the plant with their hands, and putting them in baskets.—The first crop is generally gathered the latter end of July; the second, the last week in September, and the third in November; but this is only from off such parts where the second crop was gathered first: It is carried from the field in carts to the mill, where it is ground into a green paste, and made into balls about 3 inches diameter, when it is set upon ranges under sheds to dry, which is done in two or three weeks; after this it is put into the house or pen, and kept till all the fields are gathered, and afterwards manufactured.‡

SECT.

* It is not only much used by dyers for its *blue colour*, but also for the basis of many other colours. It was with the juice of this plant that the ancient Britons stained their bodies, to make them appear more terrible to their enemies.

† Two workers to an acre, from the beginning of April to December, is the general allowance.

‡ Mr Rait, in a letter to the President, states, that he had discovered that indigo might be made from the juice that is pressed out by the mill, in manufacturing the leaves; but it seems he has not yet accomplished it, as in a subsequent letter he says, "my views upon the whole of this business terminate in one of two points; the first is to have the particles of colour separated from the

SECT. 6.—*Corn Harvest.*

The Corn Harvest—in the vale of Till, and upon Tyne-fide near Hexham, frequently begins the first week in August; while upon the cold backward soils and situations, oats will be often uncut the latter end of October, or beginning of November; but the most general harvest is in September. Most of the corn is cut with sickles, by women; seven of whom, with a man to bind after them, generally reap two acres per day.—Oats and barley are sometimes mown.

Wheat is set up in stooks of twelve sheaves each; oats and barley are (“gated,”) set up in single sheaves; and when dry, bound tight at the bottom, and led home, or set up in stooks of ten sheaves each. The stacks are mostly round; but some of the best farmers set up their barley and wheat in long narrow stacks, which keep the corn much better and dryer: And the practice of placing corn upon stone pillars, with a cap or cover over them (to keep out the mice) and a frame of wood over all, is gaining ground, and cannot be too much recommended, as it not only prevents the mice getting to it, but keeps the corn dry and airy: It is an excellent method for grain that is to be kept until Summer; and one principal advantage is, that wheat may be led from the field and set upon those stands almost as soon as reaped.—They are made both round and oblong, but most of the latter.

the liquor, and made a marketable article by itself, as indigo is; failing of that, to apply it to the use of vats, along with the liquor or juice, in which it is in the most improved state we can arrive at.”

CHAPTER

CHAPTER VIII.

GRASS.

SECT. I.—*Natural Meadows and Pastures.*

WHAT is generally understood by natural meadows, are such lands as are overflowed by rivers, and produce a crop of hay every year, without any returns of manure: Of this description of meadows we have very few in this county; what are called meadows here, are such old grass lands as are employed for growing hay almost every year, the greatest part of which are uplands: To enable them to stand this severe cropping, they are, or ought to be, manured on the surface, every third or fourth year: if this operation be neglected, they impoverish very fast. Where they cannot conveniently be dunged as above, they are depastured one year, and mown the other; or, what is better, depastured two years, and mown the third; the produce, from 1 to 1½ tons per acre, a fair crop; the aftermath (or "Fog") is frequently let from 10 to 15 shillings per acre, and is mostly consumed in fattening oxen and cows.

Lands that are intended for meadow, are "*freed*" (from being depastured with any kind of stock) at different times in the spring, from the beginning of April to the middle of May, as best suits the convenience of the occupier; particular attention is paid to the mole-hills, dung, &c. being "*scaled*,"* and the stones and other matters that might obstruct the operations of the scythe, are carefully gathered off.

* Spread abroad.

Natural Pastures, or old grass land, are most prevalent along the sea coast, these are depastured with both sheep and oxen; the general mode of stinting being two acres to an ox, and the same quantity of ground to 8 or 10 sheep, thro' the Summer, and from 1 to 2 sheep per acre thro' the Winter; the latter are either the store flock, or ewes for fat lambs.—Sometimes Cheviot wethers $3\frac{1}{2}$ years old in good condition, are put in those pastures after the fattening cattle are taken out, and pay well if they get sufficiently fat to be sold to the butchers about Christmas.

SECT. 2.—*Artificial Grasses.*

The *Artificial Grasses* most commonly cultivated in this county are, red clover, (*trifolium pratense*,) white clover, (*trifolium repens*,) and ray-grass (*lolium perenne*;) with these some people mix rib-grass (*plantago lanceolata*) and upon sandy soils, hop-medic* (*medicago lupulina*) is sown with success.—Few of these grasses are ever grown alone, except red clover, when intended to continue only one year; and even then, a small portion of ray-grass (from one to three gallons per acre) is generally sown with it, we think with much propriety, as it not only comes early in the spring, but thickens the crop, and facilitates making the clover into hay.

But when land is intended to continue for three or more years in grass, they are generally mixed in the proportion of eight or ten pounds of red clover, four pounds of white clover, and half a bushel of ray-grass per acre: to the above quantities are sometimes added three or four pounds of rib-grass, and hop-medic, as the soil suits. When red clover is grown alone, 10 or 12 pounds an acre are sown upon dry friable soils, and from 14 to 18

* This in some places is called hop-trefoil, a name properly belonging to a very different plant, viz.—*Trifolium agrarium*.

pounds upon strong loams or clays. They are sown in March, April, and May, upon lands fallowed the summer preceding for wheat, or turnips succeeded by barley, and ought always to be harrowed in, as well as rolled. Harrowing is particularly necessary upon strong lands growing wheat; and across the ridges is the best mode of performing the operation. We find, that where corn is drilled, and the intervals hoed, it pulverizes the soil, and makes the finest preparation for grass seeds of all others: where this is properly done, and harrowed once across, after the seeds are sown, they seldom or never miss; long experience having proved, that nothing requires a finer tilth than clover and grass seeds:—Upon the best soils, the clover and ray-grass mixed, are generally ready to depasture with fat sheep by the beginning of April, and from May, through the Summer, will carry six or eight sheep per acre, according to the luxuriance of the crop and fertility of the soil; the second and remaining years, they are depastured by the store flock. These pastures are frequently mown when the ray-grass begins to flower, which not only increases the bottom grass, but a quantity of excellent hay is obtained, of considerable value.

When the clovers are not depastured, but kept for hay, they are generally mown about the latter end of June; the average produce about 2 tons per acre. The second crop is rarely cut for hay, but depastured by cattle or sheep, chiefly the latter: When cattle are put into a fresh clover "fog," especially in wet weather, they sometimes hove, by the sudden fermentation of the clover; to prevent this inconvenience, cattle are put upon it in the middle of the day, when it is free from dew or any moisture, they being first filled with natural grass, which hinders them from eating so greedily, as if put on hungry; if the clover once pass, they seldom take any harm afterwards;

wards: by using this precaution, we have not had any cattle hoven, for several years.—When very much swelled, an instrument is used, (similar to that used by surgeons in tapping for the dropsy) it is so contrived, that after being thrust in between the hip and rib, (on the near side) one part pulls out, while a tube remains in the orifice, thro' which an amazing quantity of fetid air escapes, and relieves the animal; but they are very apt to hove again afterwards.

We have heard of hoven cattle being relieved, by giving them an egg shell full of tar.

The practice of keeping horses in the house, sheds, or fold-yards, all Summer, upon *cut clover, tares, &c.* was introduced into this county, about the year 1770; it is now generally adopted by the best farmers, who find their horses thrive better; are cheaper kept than depasturing at large; and also, that a quantity of manure is gained by this means, which otherwise would have been in a great measure lost, or of very little use; as the dung of horses, when dropped in pastures, is mostly destroyed by insects, in the Summer season.—An acre of good clover used in this manner, will keep from 2 to 3 horses, from the beginning of June till the end of October, about 20 weeks.

Saintfoin, Lucern, and Chicory, have been tried on a small scale, but do not seem to come into general use; the crops of clover being thought more valuable.

In order to draw any fair comparative value between the produce of old grass lands and artificial grasses, the soil and situation ought to be exactly alike, and experiments accurately conducted; for want of such data, no just conclusions can be made; but we believe, that general observation and experience have established an opinion, that the same lands which in a state of old grass carried 3 sheep an acre, will, for the first year of clover and ray-

grass, depasture 5 or 6; on rich, old grazing pastures, the difference will probably not be so great, and what they fall short in Summer, will be made up by their superiority in Winter; on clayey soils, it would certainly be a dangerous experiment to convert those rich grazing pastures into tillage, as a certain portion of such is a valuable acquisition to every farm; but they are so rarely scattered, that few farms are so fortunate as to enjoy so desirable an appendage.

SECT. 3.—*Hay Harvest.*

The hay harvest is seldom begun before the middle of June. The mowers cut from half an acre to three quarters a day, and that very ill; the hay-makers are equally indolent and inactive. After the grass is cut it is by some tedded, strewed, or spread abroad, and repeatedly turned till dry;* others, the day after it has been tedded or strewed, put it into foot cocks (wappings) which can scarcely be too small; (if the weather keeps dry it is in two days more, put into large cocks;) if the weather proves wet, we know no mode by which it will save better, or waste the smell less, as the rain passes thro' them, and a small quantity of air or sun dries them again, or they are easily turned over.—In either mode, when sufficiently dry, it is put into ricklets (provincially *pikes*) of about half a ton each in the field; which stand there for two, three, or more weeks, until a convenient opportunity offers for leading them home, to be put into one large stack. In these ricklets, the hay takes a first sweating, which prevents its heating when put into larger masses.

For the purpose of drawing it together to be put into pikes, or ricklets, it is either cocked, or put into large

* We never ted or strew clover when mown, but turn it in the swathe, with the head of the rake, backward and forward, until it be fit to put into large cocks, or pikes, which we prefer to every other mode we have seen, as it preserves the leaves upon the clover much better than when strewed abroad.

heaps, which are trailed in by one horse, yoked to the ends of a long rope, put round the bottoms of those cocks or heaps; upon the hind part of which, a boy gets with his feet, to keep it down, and prevent its slipping over the top of the hay; when arrived at the place wanted, one end of the rope is taken off the hook at the horse's shoulder, and being thus loosened at one end, the horse moves forward, when the rope draws thro' under the hay and leaves it.

When the hay is neither put into cocks, nor large heaps, but remains in a thick row, it is then necessary to use two horses, viz. — One yoked to each end of a strong sweeping rope; and two persons to get upon the rope with their feet, one on each side the row, who rest with their arms upon the hay, and step forward on the rope as the hay gathers. To prevent the hay from slipping off behind, a small cord is fastened to the hind part of the sweeping rope; and extended to each person's hand, which they let out as they step forward, or find otherwise necessary. By either of the above modes, the hay grown upon a field of 8 or 10 acres may be drawn together in a few hours, and is much more expeditious than either sledges or carts.

When the large stack is made in the field, the "Pikes," are drawn to it, by putting a strong rope round their bottom, the two ends of which are fastened to the hind part of a cart, in which are yoked 3 or 4 horses. — This saves the trouble of forking and loading them in carts, and is done in much less time.

SECT. 4.—Feeding.

Oxen,—are mostly grazed in the eastern part of the county, and a few in the vicinity of Whittingham; they are bought in May or June, and sold as they become ready, to supply the large fleets of colliers and other trad-

ing vessels belonging to Newcastle, Shields, Sunderland, Hartley, and Blythe.

Some few graziers buy only such oxen as are forward by having got turnips in the Spring: these generally go off in June, and are followed by cows, heifers, or kyloes;* of which, those that do not get fat on the pasture, to be sold thro' the Summer, are put upon fogs (aftermaths) and sold in November and December. The cows are also bought in the spring months, and are chiefly used for home consumption. The kyloes are bought at Falkirk-Tryfts, ("meetings") or at Newcastle Fair, in the Autumn, and wintered upon coarse, rough ground or straw: (sometimes a few turnips are given in the Spring) and are sold all thro' the Summer, as they become fit for the butcher, to supply Newcastle and other markets. Those that are ready to go off in June, always leave the most profit; beef being frequently sold at that season for a shilling a stone more than the ordinary prices.

The profit of grazing, like all other speculations, varies with circumstances; but we believe we may venture to average it at 3l. or 3l. 10s. for keeping on grass from May-day to Michaelmas. Cows, in general, leave more than oxen, in proportion to their weight; but they are subject to disorders of the udder, that frequently reduce the profit, and deter many people from grazing them.

Some few graziers follow the old custom of keeping only one kind of stock upon the same ground; whilst others, we think with more propriety, intermix with oxen and cows, a few sheep, and two or three colts in each pasture; which both turn to good account, and do little injury to the grazing cattle: In some cases, sheep are a real benefit, by eating down and destroying the ragwort (*Senecio*

* An excellent breed of small cattle from the Highlands of Scotland.

Jacobae) which disgraces some of the best pastures in the county, where *oxen only* are grazed.

Sheep, that have been wintered upon turnips, are put to the earliest grass that can be obtained; the clovers and ray-grass are generally ready in April; the old grass lands not before May: In both situations they are continued till shorn, and sold off, from the latter end of May, thro' all June and part of July, from 2l. to 2l. 15s. each. In 1797 the prices were from 2l. 10s. to 3l. 10s. each: The draft ewes, or shearling wethers intended for turnips next Winter, succeed them, and thus a regular rotation is kept up. Of late years, some farmers have sold their shearling wethers in July, (when only 15 months old) to the butchers, for as high prices, as from 30 to 35 shillings each: In 1796, they sold from 40 to 45 shillings each; and in 1797, as high as 50 shillings, after shearing a fleece worth 6 shillings.

A large portion of the lands of this county being liable to the rot, and unsafe for a breeding flock, the occupiers of such situations, venture ewes for fat lambs for one year; these are bought in the Autumn, put to tup early, (some in August) the lambs sold in May, June, and July; after which the ewes are fatted, and sold in October and November.—Such lambs as are early, and go off in May, often sell for 20 shillings each; but the others average at about 12s. 6d. The price of fat ewes depends much on their being of a good or slow feeding sort, and will vary from 24 to 30 shillings; The average may be called 27 shillings.—The proceeds from long-woolled ewes will be:

	£.	s.	d.
A fat Lamb	0	12	6
Ditto Ewe	1	7	0
Carried over	1	19	6
H 4			
Fleece			

	£.	s.	d.
Brought over	19	6	
Fleece	0	4	6
	2	4	0
Deduct prime cost	1	0	0
Profits on Ewe and Lamb, for one year	1	4	0

The profits of those that have lambs, sold at 20s. will be 1l. 12s.

The Cheviot ewes are generally put to a large long-woolled tup, which increases the size of the lambs: The proceeds are;

	£.	s.	d.
A fat Lamb	0	11	0
Ditto Ewes	0	14	6
Fleece	0	2	6
	1	8	0
Deduct prime cost	0	13	0
Profit for one year	0	15	0

Mr Hay of Lefbury, and Mr. Watfon of Warrn, not having so ready a market for the great quantities of bran, pollard and oat-chimmings, which their extensive manufactures of flour and oat-meal produce, have applied it to feeding different kinds of stock; they both agree that for feeding pigs, it is of little value; one of the gentlemen says, that from some experiments he had read, he was induced to enter largely on the business, and persevered in it, till he lost upwards of a thousand pounds.

For Horses—they both think it very valuable along with hay or straw, instead of corn; Mr Watfon allows his horses 6 bushels of bran, or 4 bushels of pollard, and 2 of
oat

oat seeds per week, the average price of which is about 5 shillings; the horses are in high condition, and sleek as ravens, but not more so than those that have 24 bushels of oats per week, the price of which at 2s. per bushel is equal to the value of the bran.

For Cattle—Mr Hay says, that “in the beginning of October, I tie up my cattle in sheds, and place before every beast a crib for bran, and another for turnips, and to each give a peck of *pollard*, morning and evening, with full allowance of turnips, well cleansed and topped; I frequently mix oat sheeling seeds and oat dust, which makes them fonder of the pollard, if stale or old kept. Three months stall-feeding in this way is equal to 6 months in the usual way.”

In order to form some idea of the utility of the above mode, we must estimate the expence of the pollard, in addition to the full allowance of turnips: pollard being a finer kind of bran, is sold for 2d. a bushel more; of course when bran is 10d. per bushel, pollard will be 1s. and allowing that an ox will fatten as much in 10 weeks with the above keeping, as he will in 20 by the common mode, the account will stand thus:

10 Weeks—Pollard 70 bushels, at 1s.	-	3	10	0
Ditto—Turnips, at 4s. 6d.	- - -	2	5	0
Attendance	- - - -	0	10	0

6 5 0

20 Weeks—Turnips, at 4s. 6d.	-	-	4	10	0
Ditto—Straw	-	-	0	10	0
Attendance	-	-	1	0	0

6 0 0

Hence

Hence it appears that feeding with pollard and turnips is not cheaper than the common mode, *even allowing that it is done in half the time.*

Mr Watson put 6 oxen into a fold-yard (with a shed in it) on the 20th of May; in 7 weeks they had eaten 360 bushels of bran and oat seeds mixed, with which they had for the first three weeks coarse hay, the other four, cut clover. With this their cribs were kept constantly full. The value of bran and oat seeds amounts to about 6s. per week each beast; of the hay and clover no account was kept, but it cannot be estimated at less than 1s. which makes with attendance 7s. per week each beast; near double the expence of grass, and more than the improvement of the cattle would pay, tho' they were certainly in very thriving condition.

Mr Watson once attempted to keep two heifers on bran only; they grew worse and worse, and were obliged to have other food; when they got grass, they eat much more bran than when they got bran alone.

For Sheep,—these gentlemen allow 7 bushels per week per score, to their store ewes on grass, that is 5s. 10d. per week, or 3½d. per sheep besides grass.

Mr Hay wintered 150 ewes on 38 acres; they had 53 bushels per week of bran; but this land would have wintered 70 ewes without any assistance, therefore the bran was applied to the support of the 80 additional ewes; of course the expences per week will be

	£.	s.	d.
53 bushels of bran at 10d. per bushel,	•	2	3
which divided by 80		4	
gives the expence per week of keeping			
a store ewe - - - - -	0	0	6½
which is near double the price usually paid for turnips.			

Mr

Mr Watson is summering 175 ewes on Spindleston-Hill (a bare rocky pasture); to this flock he allows 16 bushels of bran per day, or 112 bushels per week, which at 10d. per bushel, is 6½d. per week per sheep, besides the grass; they are in excellent condition, but it is a price for keeping store ewes that most farmers would stare at.

To a flock of 65, year-old fat wethers, he gives 42 bushels of bran per week, which is near 6½d. per week per sheep; they are depastured upon good land, at the rate of about 7 sheep an acre, which is scarcely double the number the same ground would keep equally well without bran, of course these sheep cost above 1s. per week per sheep, a price that the appearance of the sheep does by no means promise to repay.

These are all the facts that have come to our knowledge, respecting feeding with bran; from which it appears that it is *not so beneficial a practice as had been represented to the Board.*

CHAPTER IX.

GARDENS AND ORCHARDS.

IN gardening we do not find any practices in this district but what are generally known to the profession; and in respect to Orchards they are thinly scattered indeed.—The frosty nights, and north-east winds from the German Ocean, which are so prevalent here in the spring months, are very inimical to fruit crops; and it is probably owing to this circumstance that there is such a scarcity

city of orchards? so much so, that we believe nine tenths of the apples consumed in this county are imported from Kent, Essex, and other southern counties.

CHAPTER X.

WOODS AND PLANTATIONS.

WOODS growing in a natural state are found mostly on the banks of rivers; those of the north and south Tyne, the Wansbeck, Coquet, and their tributary streams, have by far the greatest quantity. Of old oak timber, from eighty to one hundred and forty years growth, the probable value may be about 60,000*l.* of which two-thirds can only be said to be proper for building ships of great burthen.

The demand by the collieries and lead mines for small wood, has induced the proprietors of woods on the Derwent, Tyne, &c. to cut them at an early age. From twenty-five to thirty years growth is the general term for oak, elm, and ash; but birch, willow, and alder, are cut sooner; and hazle for corf-rods* once in three or four years.

The price of ash and elm is from 1*s.* to 2*s.* per foot; of oak, from 2*s.* to 3*s.* per foot; of birch, alder, &c. for pit props, six feet long, and from four to six inches diameter, 4*d.* each; corf-rods, 6*d.* per hundred. Oak bark last year was sold for 9*l.* per ton. Under this manage-

* Corves are a kind of large wicker-work baskets, used for bringing coals out of pits, made of rods from $\frac{1}{2}$ to 1 inch diameter.

ment, and at those prices, an acre in thirty years will produce, on an average, 60*l.* clear of expences; there has been instances of an acre of wood, thirty-two years old, selling for 100*l.* and another of sixty years growth, worth 200*l.* per acre; but these were in particularly favourable situations.

In the management of these woods, the general practice is to cut all away together. The system of Anthony Surtees, Esq; of Newbiggen, we think preferable; He takes his away in *patches*; and as the older trees interfere with the younger springs, and where a thriving healthy oak is in a convenient situation, he lets it stand for timber; by this means the young spring is sheltered, and an annual produce of upwards of 100*l.* is obtained from sixty acres of woodland.

Plantations, on an extensive scale, are rising in every part of the county; and are almost in every instance doing well, and promise not only to repay the spirited exertions of the proprietors, but will add greatly to the ornament and improvement of the country.

Amongst the great variety of trees we have observed in those plantations, the larch rises proudly pre-eminent above the rest, and in almost every situation far outstrips the various species of firs and pines, wherever we have noticed them planted promiscuously together. In many plantations in the northern parts of the county, the *spruce firs*, between 20 and 30 years old, have *died-off*; and this in so many very different soils and situations, that they are now in a great measure discarded from the plantations that have been made of late years; the cause of this failure has not been yet satisfactorily accounted for.

CHAPTER XI.

WASTES.

THE commons—in this county capable of being converted into profitable tillage land are now very trifling, the greatest part having been inclosed within the last thirty years; the whole amounting to near 120,000 acres. Of this, the commons belonging to the manors of Hexhamshire and Allendale contain 50,000 acres, a great part (35,000) of which are high, exposed, heathy mountains. These are to be converted into stinted pastures, not being thought capable of any other improvement.

The increased value of such inclosed commons, depends (as we have stated in our Report of Cumberland) entirely upon the system of cultivation pursued. Upon Bulbeck-common there are lands which, in a state of common, were not worth more than 1s. an acre, a part of which has been in tillage twenty-five years, and grown three white crops successively, betwixt one fallowing and another. This land is now dear enough at 4s. an acre; while Mr Hopper's of Black-Hedley, is worth 10s. or 12s. His system is, when first broke up from heath, to pare and burn, and plough in the autumn; next spring plough across, lime and sow oats; then fallow and lime, 75 bushels per acre, and sow turnips; after which, oats and grass seeds, four pounds red clover, five pounds white, and one bushel of ray grass, and continue in grass six or seven years; then to plough for oats—turnips—oats—and sow up with grass seeds as before. There are instances, where the increased value is in the ratio of twelve to one, or even more; but these

these are, where the commons were of no value to the proprietor, which is in general the case.*

The extent of waste lands—or open mountainous districts, incapable of affording profit by cultivating with the plough, is very great, as we have before stated; considerable quantities of which are private property, and of course may be depastured by sheep or other stock to the greatest advantage; of those that are common, it would certainly be best for every man to know his own share.

Draining would be highly useful to many parts of these districts; there are also many excellent situations for planting, and of all other purposes to which such lands are convertible, this species of improvement seems to us the most promising to make the greatest returns.

CHAPTER XII.

IMPROVEMENTS.

SECT. 1.—*Draining.*

DRAINING—is one of those improvements that has lately made its way into Northumberland, and is now mostly practised in the middle and northern parts of the county; the theory is pretty well understood in those districts, and the practice is becoming more prevalent every year. Hollow drains are generally used, filled with stones, where they can be got; where these cannot be obtained,

* The stinted common of Holy Island was divided in 1790, the allotments that were gotten for a right, which never let for more than 2l. are now let for 14l. or 15l. per ann. and in a few years will be worth upwards of 20l.

(but at a great expence) sod drains are the only resource, especially in the northern parts, where there is little wood.

SECT. 2.—*Paring and Burning.*

Paring and Burning is not much practised in the eastern and northern parts of the county; in the midland and southern parts it is most prevalent, but even there it is confined to old swards, and coarse, rough, rushey and heathy lands; for the first breaking-up of such ground, it is certainly very convenient, and preferable to any other mode we have ever seen; but tho' we are fully convinced of its beneficial effects in such situations, yet we have our doubts whether it could be used with advantage upon lands that have lain a few years in grass, and that would produce good crops of grain *immediately on being ploughed out*, which is not the case with coarse, rough, heathy lands, or even very old swards on rich fertile soils; it being found that crops *on the latter*, are frequently very much injured by "*leaping*" for two or three years; which paring and burning entirely obviates, and ensures full crops to the farmer; who need not be under any apprehension of his soil being ruined by it, provided he pursues the following course:—1. Turnips.—2. Oats.—3. Fallow, well limed for turnips.—4. Barley, sown up with clover and grass seeds, and depastured with sheep for three or four years, and afterwards (if not intended to lie in grass) continue it in the rotation mentioned page 64: It is the *injudicious cropping*, more than the ill effects derived from paring and burning, that has been the chief cause of bringing such an odium on this practice, which is certainly an excellent one in *some situations*, and *properly conducted*; but like the fermented juice of the grape, may be too often repeated and improperly applied.

The popular clamour against this practice, "that it *destroys the soil*," we can by no means admit; and are inclined

ed to believe, that not a single atom of soil is abstracted, though the bulk of the sod or turf be diminished: this arises from the burning of the roots or vegetable substances, which, by this process afford a considerable portion of Alkaline Salts, phlogistic or carbonic matter, and probably other principles friendly to vegetation; as we find those ashes produce abundant crops of turnips, which fatten, stock much quicker than those after any other dressing or manure we have ever seen, and the succeeding crops of corn are so very luxuriant, as to tempt the *injudicious cultivator* to pursue it too far; and for the sake of temporary gain, may be said to rip it up, as the boy did with his goose that layed golden eggs.

SECT. 3.—*Manuring.*

In some parts of this county, where the turnip culture is carried to such extent, every exertion of ingenuity is practised to raise a large portion of *Farm Yard Dung*; for without this valuable article, it is well known that good turnip crops are not to be expected, and the farmers of strong soils are sufficiently sensible of the advantage of dung to their crops, not to use every endeavour to increase its quantity.

The farmers of turnip soils, in order to have their dung sufficiently rotted, lead it out of the fold yard in the winter, make it up in large dunghills in order to increase the putrefactive process, and prepare it for that state of dissolution, by which its component parts are ready to be assimilated into new bodies; and in which state only, it can be of use in vegetation.

Upon the hill-farms around Cheviot, we have been often surprized, to see at the doors of the shepherds' houses, such immense dunghills, the accumulation of unnumbered years, probably centuries: to avoid this increasing nuisance, many of them have *ingeniously contrived* to build

their houses near a "*Burn side*" for the convenience of having it *taken away by every flood*: notwithstanding they have lands adjoining, upon which, if this manure was properly applied, the greatest improvements would ensue, and considerable quantities of excellent hay be produced, for the support of the flocks in winter storms, in which seasons they are very often under the necessity of purchasing hay in the Lowlands, and of having it conveyed on horse-back to the top of these hills in the deepest snows, at a very great expence.*

Lime—is found in many parts of this county, of an excellent quality. In Bambro' Ward, where it has been long used, many intelligent farmers begin to doubt of its efficacy, and the propriety of continuing to lay it upon their *old tillage lands*. Upon the dry soils in Glendale Ward, where it has not been used much above 40 years,† its effects are more conspicuous, especially upon such lands as have been seldom or never limed. In its natural state, the soil of this district is dry, duffy, light, full of fibrous roots, and when in fallow, on passing over it, you sink to the ancles; after being sufficiently limed, the fibrous roots disappear, the soil becomes denser, firm to the tread, retentive of moisture, and produces better and more abundant crops of grain than before: when laid to grass, the effects of the lime appear to an inch, by the superior verdure

* We were glad to see Mr Smith, Mr Marshall, and a few others, departing from this trait of barbarism, and applying their manure in a very proper manner.

† Mr James Hall of Thornington, was the first person that ever carried a cart load of lime across the river Till, for laying upon land: The first year he prevailed upon his father to allow him to lead 10 cart load, which had so wonderful an effect, that the quantity was increased next year, and in a few years after, the use of it became general.

dure which takes place as far as it has gone.* Many of these dry soils, after being limed, grow white clover naturally; where not limed, it seldom appears; but they cover principally with *agrostis capillaris* (fine bent,) which is seldom eaten by any kind of stock, if they can get other food: When land has been sufficiently limed, this plant disappears; and wherever it is found, it may be safely concluded, that the soil on which it grows has not had its due quantity of lime.

About seven years since Mr George Reed, of South-Middleton near Wooler, cleared from broom, 30 or 40 acres of light, dry, channelly soil, that had *never been limed*, which was sown with rye; the rye stubble was ploughed in the Autumn, and the worst part of it limed at the rate of 100 bushels per acre; next Summer the whole was drilled with turnips (dunged &c. as described page 89) which came up all alike, and continued to do equally well for three or four weeks; but little or no rain falling in that period, and the weather continuing drougthy, those turnips upon the land which had *no lime*,

* About twelve years since, when looking over the farm of Thornington, with Mr James Hall, (the late tenant) we were surprised with the sudden alteration in the verdure of the land, which took place immediately at the junction of two ridges, one side was a fine dark green, *eaten very bare*, and covered with a thick mat of *white clover and ray-grass*; the other was a dingy brown, principally composed of *fine bent*, and *sheep's fescue*, and in a great measure *neglected by the sheep*: An explanation was desired for so great a contrast, and Mr Hall informed us, that when this parcel of land was last in fallow, the part which was *eaten so bare*, and looked so green, was *well limed*; the other, which the sheep neglected, had *never been limed*.

It has been said, and repeatedly copied by writers on Agriculture and Botany, that "*sheep prefer the "Festuca Ovina" to all other plants*:" In the above instance, it was quite the contrary; from which, and from other observations we have made, we are inclined to believe, that the idea has probably originated more in conjecture than experiment. It has also been remarked by botanical writers, that sheep refuse to eat ragwort, (*Senecio Jacobaea*;) The fact is, they are so very fond of it, they will not allow a plant to flower wherever they depasture.

died away; whilst those upon that part which *was limed* were discernible *to an inch*, flourished with unabated vigour, and produced an excellent crop, (for such land) worth at least 4l. 10s. an acre; many similar instances might be produced, but this is the most striking we recollect to have noted.

The mode of burning lime, in this county, is mostly in draw-kilns, of the form of an inverted cone, with two or three eyes or mouths for drawing out the lime, and admitting air: These kilns are kept burning and drawing perpetually. Some of the large sale kilns will afford 40 or 50 cart load a day: A cart load of coals is reckoned to burn two cart loads of lime.

The Price, at the kilns, is from 3s. to 4s. 6d. for 25 upheaped bushels.

The Quantity, laid upon an acre, is from 75 to 150 bushels.

The general practice of using lime, is to lay it up in heaps of three or four cart loads each; and as soon as the clods are fallen, slacked, or reduced to the state of quick-lime, it is spread evenly upon the land, and harrowed and ploughed in as soon as possible after: Sometimes, instead of laying it up in heaps of 3 or 4 cart loads each, it is laid upon the land in the clod state, in little heaps of about a bushel each, which are covered with earth until sufficiently slacked or fallen, and then spread abroad.

In either mode, or in whatever manner lime is applied, it certainly has the greatest effect, when both it and the soil are in the most pulverized state.

Upon the turnip soils where very large quantities of lime are used, it would be extremely difficult to get a sufficiency in the early part of Summer, previous to the turnip season; in such situations, it is usual to lead as much as possible thro' the Summer and Autumn, which

is laid up in very large heaps (from 50 to 150 loads each) and before Winter covered with sods, or thatched with straw, to prevent the rain from penetrating it: If well secured, it is found in a very quick state, in the Spring, sometimes a great portion of it remaining unslacked.

The opinions respecting the good or ill effects of lime, are exceedingly various; some asserting that it can never be used in too large a quantity; whilst others contend, it is of no use whatever: Our own practice authorizes us to say, that upon some soils, the application of lime, (or calcareous earth in some other form) in considerable quantities, is absolutely necessary, in order to bring them to their most fertile state, and to prepare them for the action of other manures; whilst upon other soils, lime produces no sensible effect, and if used in large quantities, will prove very detrimental.—Thus may one of the most valuable applications we know, for the improvement of many soils, be condemned, by those who draw *positive conclusions*, from *partial observations of facts*. The practice of paring and burning, we believe, owes the opprobrium, which some have thrown upon it, to a *similar mode of reasoning*.

Stone Marl, has formerly been used in considerable quantities, near Tweedside, but the more immediate effects of lime have entirely set aside the use of stone marl.

Shell Marl is used with great advantage, at the rate of 20 or 30 cart loads an acre, on the farms of Wark, Sunnyslaw, and Learmouth.

Sea Wrack, Sea Ware, or Marine Plants—driven ashore by the tide, are used with great effect, wherever they can be had. Of these the *fucus vesiculosus*, and its relatives *F. ferratus* and *inflatus*, (Skeir Ware) are not held in much estimation, and when used, require to be laid up in large heaps to putrify. If laid upon the land, as the others

are, when taken immediately from the shore, they dry, and turn to a black coriaceous substance. The *fucus digitatus* (Waffels) is the great favourite, and another species called *May-weed*, which we cannot point out by its Linnæan name, not having had an opportunity of seeing it, but from the descriptions we have heard, suspect it to be the young plants of the *fucus digitatus*.

Coal Ashes—are chiefly used in the vicinity of the principal towns, as a dressing for grass land; for this purpose they are found of considerable benefit, especially upon strong, coarse, and wet lands.

SECT. 4.—Weeding.

Weeding corn is universally practised; the broad cast crops are hand-weeded, in which operation the thistles (being rather unpleasant to handle) are in some parts drawn by a pair of large pliers ("nippers") with flat cheeks; in others they are cut over by a weeding hook, made in the form of a Δ , with sharp edges on the inside; but this mode of cutting is only a temporary relief, as they spring again very soon after: pulling up by the roots ought certainly to be practised in every instance, as there is not a weed the farmer has to contend with, more difficult to eradicate than the corn thistle, (*Carduus Arvensis*.)

The drilled crops, are both horse and hand hoed, at least twice each, and with so much attention, that no kind of weeds are suffered to remain; the whole being kept in the cleanest and completest garden-like culture.

The most prevalent weeds, that give the Northumbrian husbandman the greatest trouble, are :

Of

Of the *Perennial* kind,Triticum repens—*Couch Wheat*.Avena elatior—*Tall Oat*.*Holcus mollis—*Soft Holcus*.

} These all go under
the general names of
Quickens, *Couch*, or
Twitch grass; the
Holcus principally on
light dry soils.

Seratulæ arvensis, or

Carduus arvensis.†

} *Corn Thistle*.*Annuals*.Sinapis arvensis—*Wild Mustard*.Sinapis Alba—*White Mustard*.Raphanus Raphanistrum—*Wild Radish*.Avena Fatua—*Wild Oat*.} *Charloc*.

Those of less note, and more partial visitants, are

Galeopsis Tetrahit

Hemp dead nettle

Spargula arvensis

Corn Spurry

Anthemis Cotula

Stinking Camomile

Polygonum Persicaria

Peachwort

Ranunculus arvensis

Corn Crowfoot

Lythospermum arvensis

Corn Gromil

Veronica arvensis

Corn Speedwell

Scandix Pecten Veneris

*Shepherd's needle*SECT. 5.—*Watering*.

Watered Meadows—were first introduced into this county by Messrs Culley, about 26 years since; and notwithstanding the manifest advantages of this operation, yet so slow is knowledge in making its way, that it was near 20 years before any other person ventured to pursue the practice, and profit by the example: It is now begin-

* This is readily distinguished from the other kinds of quickens, by its bulbous or granulated roots.

† Linnæus has classed this plant with the *Serapilla*; but Lightfoot has very properly removed it to the *Carduus*.

ning to spread in the neighbourhood, and we hope in a few years will be adopted in every situation that can derive benefit from it

Sir William Lorrain, with a spirit that marks his wish for improvement, brought two men from Leicestershire, to drain his grounds at Kirkharl. This business they seem to have understood and executed well; but we think they have misled the worthy Baronet, in telling him they understood laying out land for watering. We were sorry to see a first attempt executed in so bad a style, which may tend more to discourage the practice, than forward its introduction.

SECT. 6.—*Embankments.*

In the vicinity of Wooler, a large tract of low flat ground (called *Haughs*) adjoining the rivers Till and Glen, being subject to be frequently overflowed, an attempt was first made to embank them at Yevering, in the year 1787 which answered the purpose, and soon after was adopted on the haughs of Turvilaws, Doddington, Ewart, &c by which the lands that could not be let for more than 15s. per acre (from the great hazard of losing the crop) are now let for more than double the sum.

The height of these banks is from 3 to 5 feet; the form is represented by a section fig. 6, pl. 5, where the height CE is 4 feet, the base BA 15 feet, BC 5 feet, and the slope next the water CA, 13 feet. The side BC was faced up with sods the green side out, cut from the ditch D, out of which was dug the materials for forming the bank;* and

* In some situations it is best to cut the ditch, on the side next the river, leaving checks at proper intervals, to prevent the run of the water. These cavities fill up in a few years, with mud brought by the floods; and the bank is in less danger of breaking when there is no ditch at the back of it.

the side CA, covered with green sods pared from the base BA, previous to throwing up the earth.

The expence from 2s. to 3s. per rood of 7 yards.

CHAPTER XIII.

LIVE STOCK.

SECT. 1.—*Cattle.*

THE different kinds of cattle bred in this county are the short horned—the Devonshire—the long-horned—and the wild cattle.

The short horned kind have been long established over the whole county, the other kinds are found only in the hands of a few individuals, who have introduced them with a laudable view of comparing their merits with the established breed of the country.—They differ from the other breeds, in the shortness of their horns, and in being wider and thicker in their form, consequently feed to the most weight; in affording the greatest quantity of tallow when fatted, in having very thin hides, and much less hair* upon them than any other breed (the Alderneys excepted); but the most essential difference consists in the quantity of milk they give beyond most other breeds: there being instances of cows giving 36 quarts of milk per day, and of 48 firkins of butter being made from a dairy of 12 cows: but the more general quantity is 3 firkins per cow in a season, and 24 quarts of milk per day:

* It is probably from the thinness of their hides and hair, that they are accounted tenderer than most other breeds.

Their

Their colour is much varied, but they mostly are an agreeable mixture of red and white. From their being in many places called the Dutch breed, it is probable they were originally brought from the Continent.

They have been much improved of late years, by the exertions and attention of enterprising breeders; who have already improved them so far, as to be sold fat to the butchers at $3\frac{1}{2}$ years old. The weight of the carcase is in general from 60 to 80 stone, (14 lb. to the stone) but there are instances of individuals attaining much greater weight.

Sir H. Grey bred and fed two seven-years old oxen that weighed 152 stone 9 lb. the four quarters only; and a spayed heifer, 132 stone, 6 lb. ditto. Mr Smith of Togstone, a cow, 127 stone 11 lb. ditto.

But large size is not now considered as an excellence: Quick feeders, that lay their fat upon the most valuable parts, and have the least offal in the coarse parts, are the kind which every enlightened breeder wishes to be possessed of.

The long Horns have been introduced from the improved stocks of the Midland counties, at different times and by different breeders; but have in most instances given way again to the improved breed of short horns.

The Devonshire breed is only in the possession of Walter Trevelyan, Esq. of Nether Witton, who introduced them about three years since; their offspring has not yet got to a proper age to form a judgment of their comparative merits.

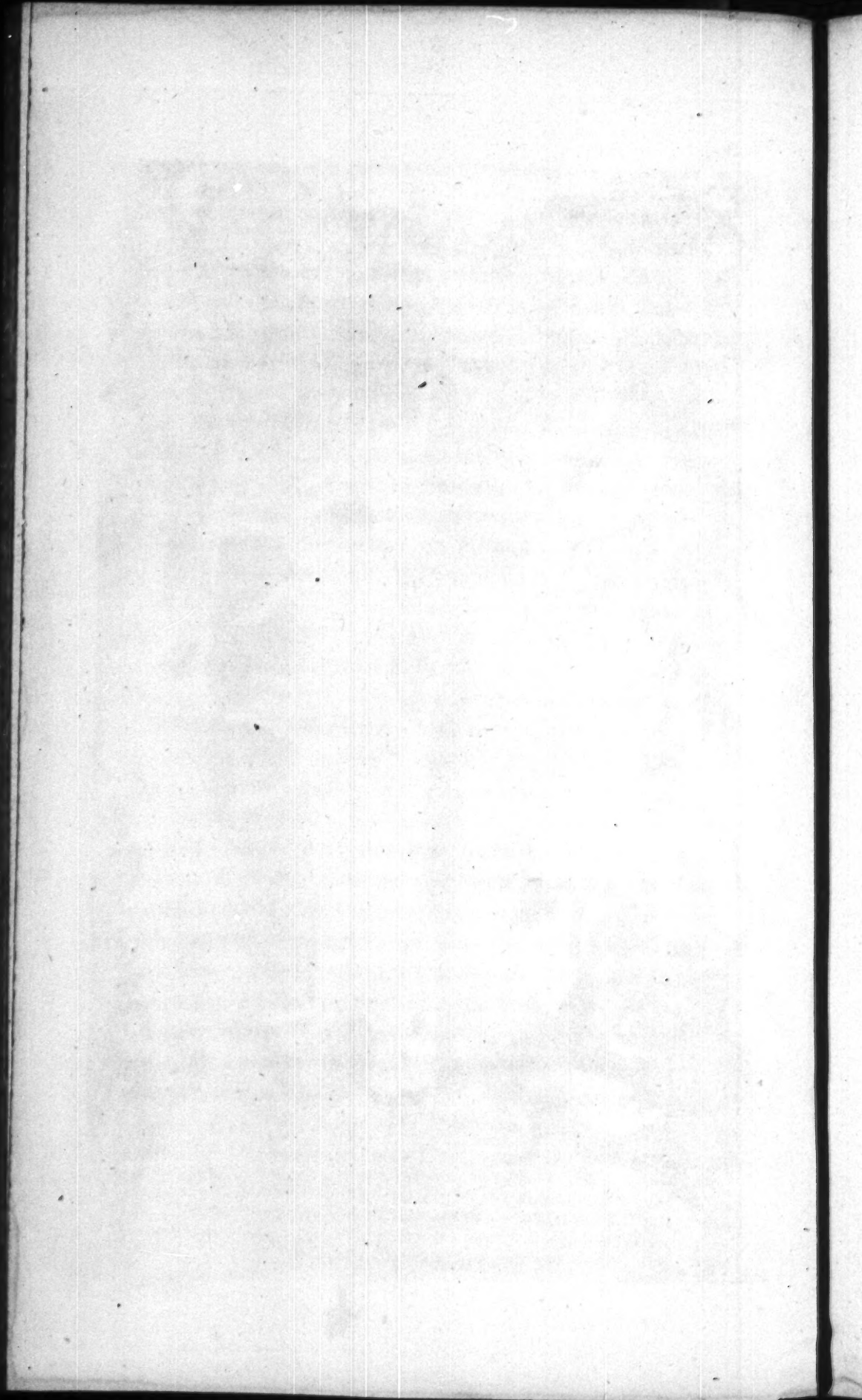
The Wild Cattle—are only found in Chillingham Park, belonging to the Earl of Tankerville; and as it is probable they are the only remains of the *true and genuine* breed of that



Wilde rind? Brand.

WILD CATTLE in Chillingham Park

London, 1854.



that species of cattle,* we shall be more particular in our description.

Their colour is invariably white, muzzle black; the whole of the inside of the ear, and about one third of the outside from the tip, downwards, red; horns white, with black tips, very fine, and bent upwards. Some of the bulls have a thin upright mane, about an inch and an half, or two inches long. The weight of the oxen is from 35 to 45 stone, and the cows from 25 to 35 stone, the four quarters; 14 lb. to the stone. The beef is finely marbled, and of excellent flavour.

From the nature of their pasture, and the frequent agitation they are put into, by the curiosity of strangers, it cannot be expected they should get very fat; yet the six years old oxen are generally very good beef. From whence it may be fairly supposed, that in proper situations, they would feed well.

At the first appearance of any person they set off in full gallop; and, at the distance of two or three hundred yards, make a wheel round, and come boldly up again, tossing their heads in a menacing manner; on a sudden they make a full stop, at the distance of forty or fifty yards, looking wildly at the object of their surprize; but upon the least motion being made, they all again turn round, and gallop off again with equal speed, but not to the same distance: forming a shorter circle, and again returning with a bolder, and more threatening aspect than before; they approach much nearer, probably within thirty yards, when they make another stand, and again gallop off: this they do several times, shortening their

* We are no strangers that there may be found in two or three different Parks of the kingdom, breeds of cattle which pass under the denomination of Wild Cattle; but are inclined to believe that they have been contaminated by crossing, and that those in Chillingham Park are the only remains, which answer the description given by *Boethius*, of this species of cattle.

distance,

instance, and advancing nearer; till they come within a few yards, when most people think it prudent to leave them, not chusing to provoke them further, as it is probable, that in a few turns more they would make an attack.

The mode of killing them was, perhaps, the only modern remains of the grandeur of ancient hunting. On notice been given, that a wild bull would be killed upon a certain day, the inhabitants of the neighbourhood came mounted, and armed with guns, &c. sometimes to the number of an hundred horse, and four or five hundred foot, who stood upon walls or got into trees, while the horsemen rode off the bull from the rest of the herd, until he stood at bay; when a marksman dismounted and shot. At some of these huntings, twenty or thirty shots have been fired before he was subdued: on such occasions, the bleeding victim grew desperately furious, from the smarting of his wounds, and the shouts of savage joy that were echoing from every side: from the number of accidents that happened, this dangerous mode has been seldom practised of late years; the park-keeper alone generally shooting them with a rifled gun, at one shot.—When the cows calve, they hide their calves, for a week or ten days, in some sequestered situation, and go and suckle them two or three times a day. If any person come near the calves, they clap their heads close to the ground, and lie like a hare in form, to hide themselves. This is a proof of their native wildness, and is corroborated by the following circumstance, that happened to the writer of this narrative, who found a hidden calf, two days old, very lean, and very weak; on stroking its head, it got up, pawed two or three times like an old bull, bellowed very loud, retired a few steps, and bolted at his legs with all its force; it then began to paw again, bellowed, stepped back, and bolted as before: but knowing its intention,

tion, and stepping aside, it missed me, fell, and was so very weak, that it could not rise, though it made several efforts; but it had done enough, the whole herd were alarmed, and coming to its rescue, obliged me to retire; for the dams will allow no person to touch their calves without attacking them with impetuous ferocity.

When any one happens to be wounded, or grown weak and feeble through age or sickness, the rest of the herd set upon it, and gore it to death.

Dairy.—This county cannot boast of its dairies; those who live in the vicinity of Newcastle, and other populous places, make a handsome return by the sale of milk, fresh butter, &c. but upon most of the large farms in this county, dairies are not held in much estimation.

Breeding young cattle—is practised in almost every part of the county. Upon the large farms, cows are kept more for this purpose than the profit of dairying: there are instances of 50 or 60 calves being brought up in one season, by one farmer, who did not milk more than fifteen cows. Calves are certainly best reared with milk, but where such numbers are bred, many different things have been mixed with, or substituted for, this nutritive and natural diet; oats and bean meal, oil cake, lintseed, boiled turnips, &c. are used, and have their various advocates; but lintseed is most approved; eggs are excellent for mixing in the calf's food; when cheap in the Spring, perhaps they cannot be better employed. In the Summer the calves are turned to grass, and in the first Winter get turnips and straw. After being a year old, they are kept in Summer on coarse pasture; and in Winter on straw only.

Hiring Bulls—for the season, is practised in this county; as high as 50 guineas have been paid for a bull of the short-horned breed, for one season, and from 3 to 5 guineas given, for serving a cow; but the more common premium is a guinea.

SECT. 2.—Of Sheep.

In this county there are three distinct breeds.—The Cheviot sheep, the Heath sheep, and the long-wooled sheep.

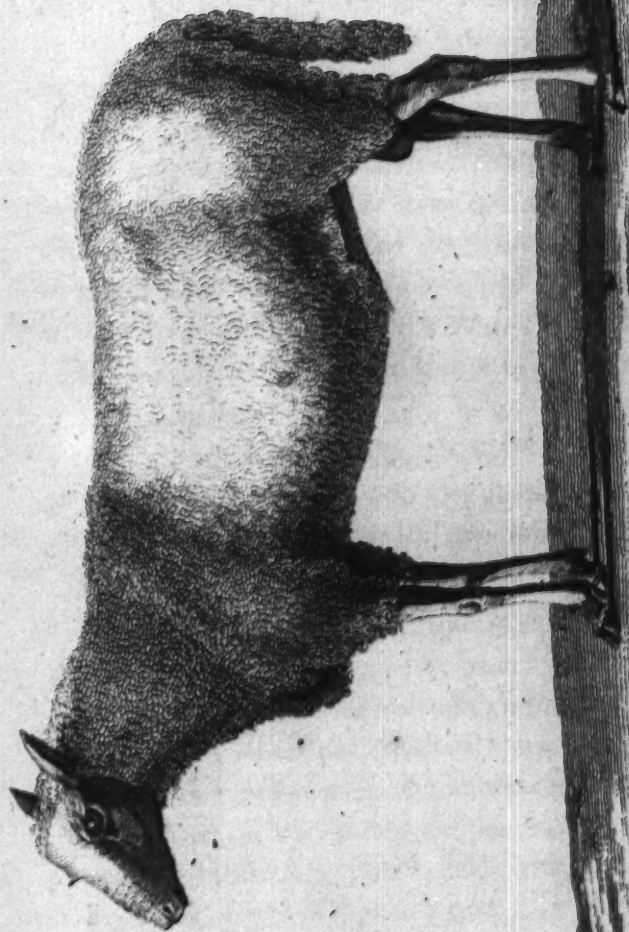
The Cheviot sheep—are hornless, the faces and legs in general white.* The *best breeds* have a fine open countenance, with lively prominent eyes; body long, fore quarters wanting depth in the breast, and breadth both there and on the chine; fine clean small boned legs; thin pelts, weight of carcase when fat, from 12 to 18 lb. per quarter; fleeces from $2\frac{1}{2}$ to $3\frac{1}{2}$ lb each, and sold in 1792, for 11d. per lb. The wool is not all fine, there being in a fleece of 3 lb. weight, only 2 lb. of fine wool, worth one shilling per lb. (when the whole fleece sells at 10d. per lb.) and one pound of coarse, worth only 6d. per lb.

They are bred only upon the hilly districts in the north-west part of the county, and do not extend much farther south than Reedwater.

The *best kind* of these sheep are certainly a very hardy and valuable mountain sheep, where the *pasture is mostly green sward*, or contains a large portion of that kind of herbage; which is the case with all the hills around Cheviot, where these sheep are bred; for as to the mountain of Cheviot itself, no kind of sheep whatever are bred upon it; and we find it an universal practice, amongst the most experienced sheep farmers, to depasture the *heathy*

* Many of the Cheviot sheep have dark faces, and were more so formerly. We were informed by Mr Chisholm, Mr Readhead, Mr Marshall, &c. that these dark-faced ones grew equally as fine wool, were as hardy, and equally as good thrivers as the white-faced ones; but that the people to whom they sold their sheep, and especially tups, preferred white faces; for which reason, they have endeavoured to get quit of black faces.

districts



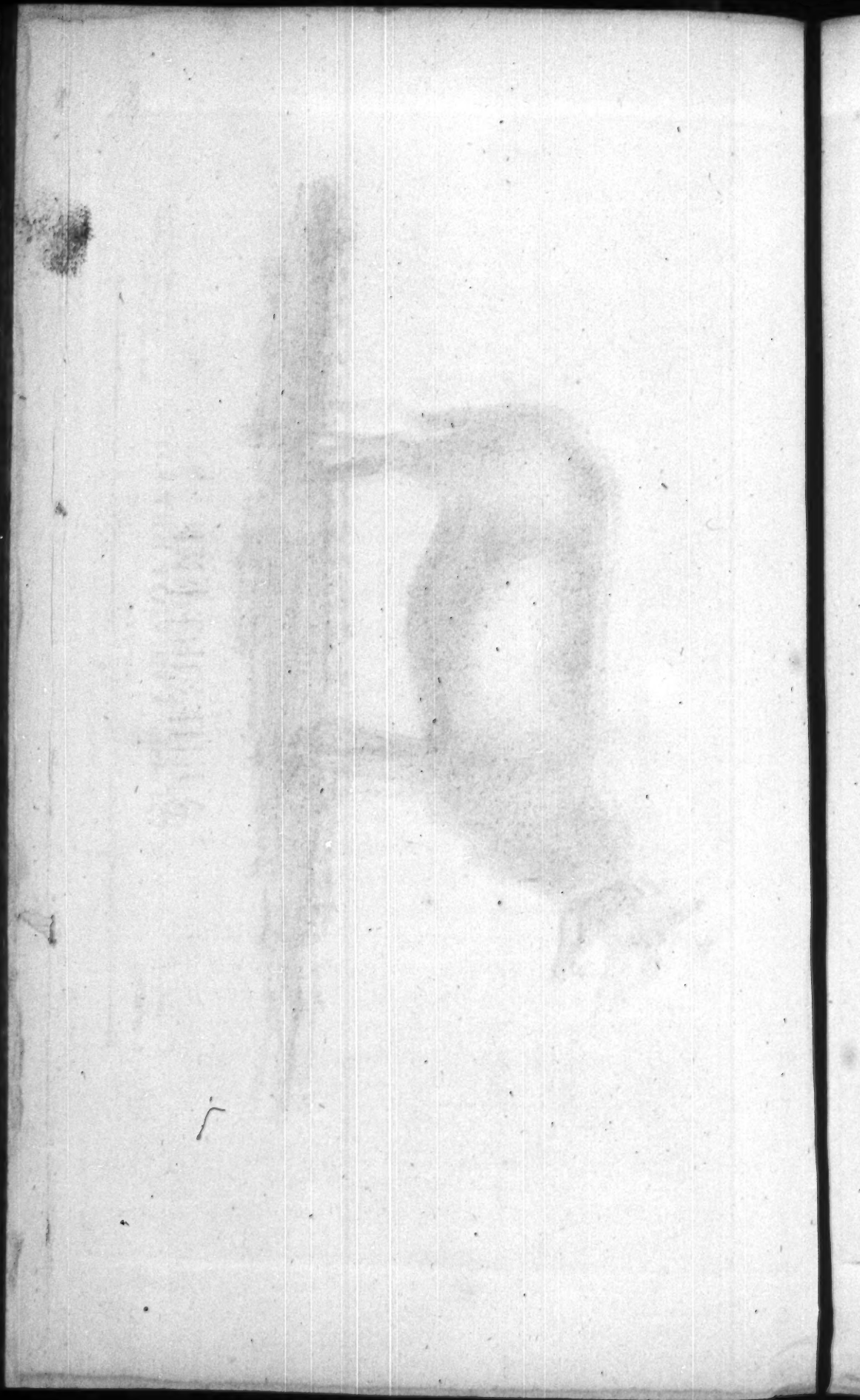
A RAM of the CHEVIOT BREED.

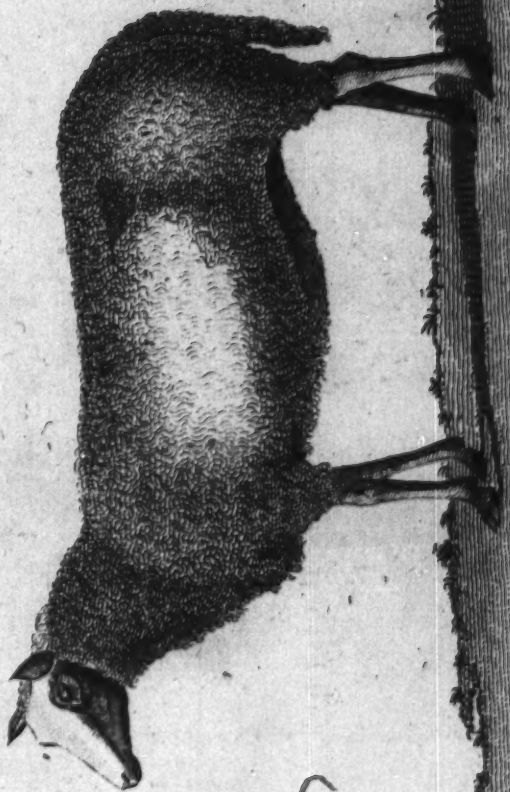
Reid del. 1794.

Scale of Feet

Wool weighs 2 1/2 lb. Standard.







A CHEVIOT EWE

From a drawing by J. G. Thompson

Revised ed.

districts with old sheep, (gimmers and wethers) but they never attempt to keep a breeding flock upon them.*

Blindburn is probably the highest and coarsest pasture in this county where this kind of sheep are bred. We examined the herbage, and found, that the ewe-pasture had a considerable portion of green sward, the coarsest parts of which consisted of

Nardus stricta	Wirebent†	
Juncus squarrosus	Stoolbent	
Scirpus cæspitosus	Deer hair	
Eriophorum vaginatum	{ the leaves	Ling.‡
	{ the flowering stem,	Moss.
Erica vulgaris	Heath or Hadder.	

The shape of this breed of sheep has been much improved of late years; but all those who have been aiding in making such improvements, readily acknowledge,

* Mr Robson of Chatto, informed us, that ewes and lambs would not do upon his farms of *Common Burn*, near *Wooler*, and *Felbope*, and *Carshope*, at the head of *Coquet*. On such situations, the gimmers are found to be hardier, or do better than the wether sheep of the same age, called *Dinmonts*.

† The English names inserted after the Latin ones, are such as the Cheviot shepherds know them by.

‡ In the county of Durham, Yorkshire, and some other parts, *erica vulgaris* is known by the name of *ling*. This plant grows in wet mossy places; it generally springs in February and March. The sheep are remarkably fond of it, not only the flowering stem, but the roots; and will scratch away the mossy soil six or eight inches deep, to obtain it. We have seen them working up to the eyes for this purpose. The shepherds tell wonderful tales of the nutritive powers of this plant; asserting, that sheep reduced by hunger, will recover faster, and thrive much better upon this plant, than turnips. It is certainly a valuable plant for three or four weeks; but after it has flowered, the sheep totally neglect the flower stem (*moss*) and depasture only on the leaves, (*ling*.)

It is somewhat singular that the Cheviot shepherds should consider the *flowering stem*, and the *leaves* of this plant, as two distinct species; nor could some of them be convinced to the contrary, until the plant was taken up, and they were shown, that their *moss* and *ling* grew both from the same root.

there

there is still much to be done; especially to the fore quarter, which they all agree is very defective; but we hope it will not long remain so, as we think we see a spirit of investigation arising amongst these breeders, that in a few years will remedy not only this defect, but will discover others, which at present they are not willing to admit. But as knowledge is progressive, we cannot expect the perfection of this breed of sheep can be obtained at once; it must proceed by slow gradations, as every other improvement hath done; it is a great point gained, that we admit defects, and are desirous to amend them.

That breed of sheep which brings the most profit to the farmer, will always be pursued by him, whatever his situation; but that object, we presume, is not to be obtained in this district from *fine wool alone*. Perfect mountain sheep should be *active, hardy, well formed, and quick feeders*: these qualities will always recommend them to the grazier, who will never purchase a slow feeding animal, while he can get one of a different sort, though at a considerable advanced price. But if to these qualities, so essential to the sale of a mountain farmer's stock, can be added a *fleece of fine wool*, a breed of sheep would then be obtained, the properest for a hilly district of any we have yet seen. There is little doubt but this may be accomplished by *proper selection*; and probably the *best kind* of Cheviot sheep, from their hardiness, and producing a portion of fine wool, are the properest stock for laying the foundation of so desirable an improvement.

Mr Robson, of Belford, (now of Chatto) says, he improved the shape of his sheep very considerably; particularly the fore-quarter, and the wool, in having less buttocks; by using three rams which he purchased in Lincolnshire, thirty-three years since; and we know other instances of improvement, by using tups of $\frac{1}{2}$ or $\frac{1}{4}$ Dishley blood.

blood. In all these cases, we do not find the sheep less hardy, or wool of less value; but the carcase materially improved.*

Mr Readhead, of Chatto, is of opinion, that there are some situations amongst the Cheviot-hills, where the South Down sheep might be successful; those who are possessed of such, would do well to make a *fair* experiment; should it succeed, a very great improvement of the Cheviot wool, in point of fineness, would be derived by crossing with this breed: but probably what it gained in fineness, it would lose in weight, for it is not the value per pound which constitutes the farmer's profit, but the value *per fleece*; or rather, that breed is *the best*, which brings the *most profit in fleece and carcase jointly*,† from the same ground, in equal times. Opinions and conjectures will never decide this matter; it can only be done by *fair* experiments, conducted by persons of judgment and impartiality.

The Mode of Management—amongst the sheep farmers of these hills, is to divide their flock into different parcels, viz. lambs, hogs, gimmers, ewes, and wethers, and each parcel kept on such pasturage as is thought most proper for them. Every parcel is attended by a shepherd, who is bound to return the number of sheep delivered to him, either alive, or in his account of dead sheep, which are in

* Mr Smith, of Woodhall, had some of his Cheviot ewes put to a tup of Mr Thompson's; the produce of which were examined when 18 months old, by Mr Robert Thompson, and the report was, that the form was amazingly improved, and the gimmers stood the Winter remarkably well. This Gentleman is pursuing the experiment, and we hope will find the produce of the *third* or *fourth* cross sufficiently active and hardy for seeking their food on many of the hilly pastures around Cheviot.

† This criterion militates very strongly against the Spanish sheep; unless they can be found with carcases of superior form, and inclination to fatten, to any we have yet seen.

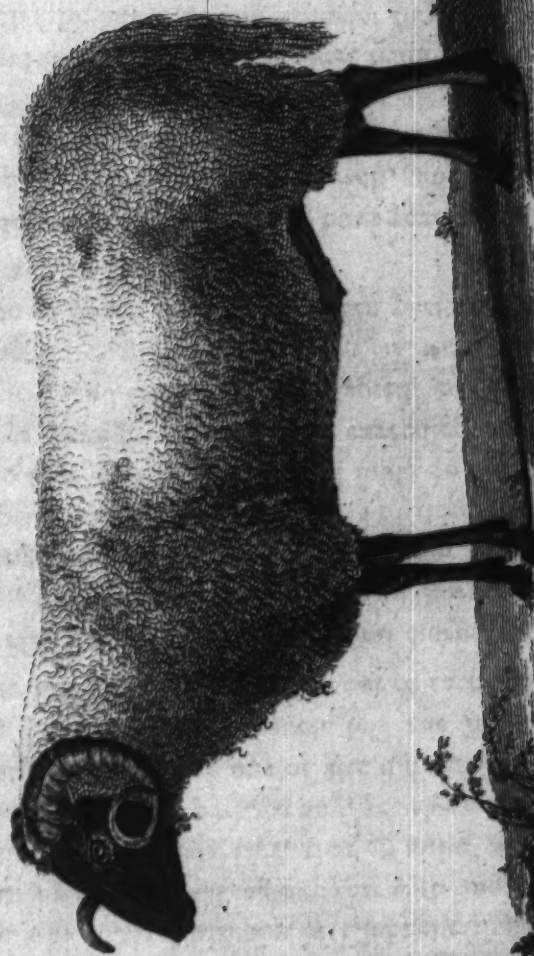
general sold at different prices, according to their goodness.

The ewes are $2\frac{1}{2}$ years old before they are put to the tup; and are kept till five or six years old: the loss of lambs is sometimes very considerable, not only on being dropped, but also from other disorders, as the "*milk-ill*," which attacks them from 3 to 7 days old, the "*quarter-ill*," &c. which Mr Chisholm of Clennel estimates at not less than 15 per cent. taking one year with another. And Mr Smith of Woodhall says, that "altho' the Cheviot breed be as healthy as perhaps any, yet there can hardly be an instance adducible of any of the different sheep flocks coming all to the shears, much less the hogs; out of which it is common to allow two out of each score."

The Heath Sheep—have large spiral horns, black faces and legs, a fierce wild-looking eye, and short firm carcasses (weighing from 12 to 16 lb. per quarter) covered with long, open, coarse shaggy wool. The fleeces weigh from three to four pounds each; and sold, in 1792, for sixpence per pound. They are an exceedingly active and hardy race, and seem the best adapted, of all others, to high exposed *heathy* districts; such as we find them in possession of here, from the western parts of the county of Durham, to North Tyne.

Mr Hopper, of Blackhedley, buys year old wethers of this kind of sheep for 10s. 6d. each, and two-year olds for 14s. which he depastures upon a *heathy moor* of 4000 acres; from whence he takes them at $3\frac{1}{2}$ years old to turnips; and sells, the May following, from 28 to 32 shillings each: he has tried the Cheviot sheep in the same manner, but thinks the other a hardier and better feeding sheep.*

* Mr Hopper says, that the best sheep of this kind he has tried, are bred about Moffat, in Scotland.



ARAM of the HEATH BREED.

Wool only 1/2 of the breed.

Wool only 1/2 of the breed.

The breeders of this kind of sheep on the south west corner of the county, are very confident, that they are a *much hardier sheep* than the Cheviot breed; and upon their high exposed heathy mountains, where there is *very little green herbage*, much more profitable; while the Cheviot farmers assert, that theirs are equally hardy, and that the greater value of the fleece gives them a decided superiority. We have before stated that the fineness of wool is not a proper criterion, by which the merits of a breed of sheep are to be determined; it can only be done by fair experiment, in which all the circumstances of the case are included; but we do not find that this has ever been done by either party, and tho' it is only opinion against opinion, yet both parties are so positive, that they are ready to quarrel with any person who happens to express an opinion of his own: we shall therefore content ourselves with stating, that the question can only be properly decided by a parcel of each kind of ewes (suppose 100) being depastured and kept in every respect equally alike, upon some of those high, exposed situations, the height of which is much more elevated, and the herbage much coarser than the Cheviot pastures; and almost totally covered with *Heath or Hather (Erica Vulgaris.)* And at the end of *five, six, or seven years*, that breed which has brought the greatest number of sheep to market, and made the most profit, will deservedly be deemed the *hardiest, best, and most eligible*, for such situations.

Until some experiment of this kind determine the matter; we hope, we shall not give offence to either party by stating, that we have seen the heath sheep bred with advantage upon higher and coarser pastures than *Common Burn*, or those others around Cheviot, which are deemed improper for a breeding flock of the Cheviot kind; and that it may probably turn out, that each breed is particularly adapted to particular situations, the one to *coarse expos-*

ed mountains, where the luxury of green herbage is thinly scattered, or rarely to be found: the other, to *hilly pastures*, where considerable portions of verdant surface predominate, such as characterize the pastoral districts around Cheviot.

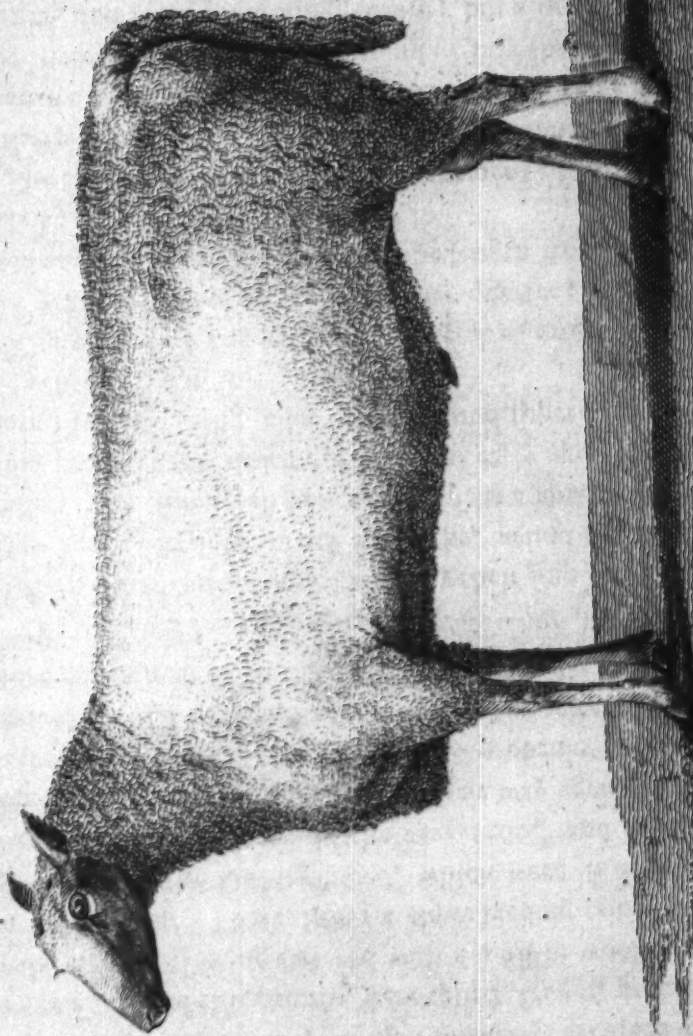
The long-woolled sheep,—which formerly occupied the lower district of this county, were called *Muggs*, probably from their faces being covered with a muff of wool, close to their eyes. These being a slow feeding tribe, have given way to the Dishley breed, which were first introduced into this county in the year 1766,* and by their superior merit have so far made their way against every prejudice and opposition, that it is probable in a few years there will be a difficulty in finding a flock that is not more or less related to the Dishley blood.

The improved breed of long-woolled sheep—are distinguished from other long-woolled kinds by their fine lively eyes, clean heads, straight broad flat backs, round barrel-like bodies, very fine small bones, thin pelts; and that singular property of making fat at an early age, perhaps more than any thing else, gives them a superiority over the other breed in this island.

The weight of the carcase in general is, ewes three or four years old, from 18 to 26 lb. per quarter; the wool upon an average, $7\frac{1}{2}$ lb. a fleece; the length from 6 to 14 inches; sold in 1792, at 10d. per lb.

The most approved mode of management of this breed of sheep is as follows: The ewes generally lamb in March, when we give them a few turnips to increase their milk. The latter end of June or beginning of July the lambs are weaned, and sent to middling pasture; but a good pasture would certainly be a more eligible practice. The ewes are milked two or three times to ease their udders, and such

• By Messrs Culley.



Barley del. 1794.

Wool 353 Strands.

A new shorn RAM of the improved LONG WOOLLED BREED.

Scaly or Not

3

4

as are not intended to be continued for breeding, are culled or draughted out, and put to clover: when this fails, they get turnips, and are sold about Christmas to the butchers, very fat; the price from 34 to 40s. each; frequently measuring four or five inches thick of fat on the sides, and two or three inches down the back, all the way from head to tail. And though this breed be not eminent for much tallow, yet ewes under such circumstances have been known to produce from eighteen to twenty-four pounds of tallow each.

The lambs, after being weaned, take the name of Hogs. They are generally put to turnips the beginning of November, and continue at them till the middle of April or beginning of May; when the wether hogs are put upon good pasture, or second year's clover. The second Winter they have turnips until the clovers are sufficiently grown to receive them, which is generally about the middle of April: they are clipped or shorn about the middle of May, when we begin to sell them, and are mostly all sold by the middle or end of June. Morpeth is our best market, where the two shear wethers are generally sold for from forty to fifty shillings a head; in 1797, they sold for 3l. per head on an average. At this age they are equally fat as the ewes before described:

Of late years it has been customary to sell the shearling wethers, in June or July, to the butchers, fatter than most other breeds will be at two or three years old; the weight of these shearling wethers is from 18 to 21 lb. per quarter.

We generally reckon one third of the ewes to have twin lambs. They are put to the tup, so as to have lambs at two years old, and kept for breeding until three or four years old, except such as are of particular good forms, or have other valuable properties: these we keep as long as ever they will breed. Such as are defective in

shape, suspected of being slow feeders, or other unprofitable qualities, we never put to the tup, or attempt to breed from them.

Letting Tups—to serve ewes for the season, has been a practice in this county for near 30 years, and is becoming more prevalent daily; the prices vary from five to one hundred guineas, for the use of one sheep; and ewes are frequently taken in to be served by a favourite ram, at as high rates as from 3 to 5 guineas each. The number of ewes to be served by a shearing tup, is generally stipulated not to exceed 80, and for an aged sheep 120.

At the first introduction of this breed of sheep, a great prejudice was raised against them, and clamorous outcries made, that their adoption would be the ruin of the country, and no means were left untried to depreciate their value: but every obstacle has been overcome by their superior merit, which seems now to be universally acknowledged, as may be judged from the following circumstance.

In October 1795, Mr Thompson of Chillingham Barns, having quitted a farm, he advertised to sell by auction, 500 ewes, in lots of 5 each.

£. s. d.

The first 100 ewes, sold on an average for 21 0 0 per lot of 5 each.

The second 100 for 20 2 6 ditto

The first 100 gimmers for 29 0 0 ditto

Several lots of the gimmers sold for above 35l. each lot, one in particular for 38l. or 7l. 12s. each sheep.

The highest lot of ewes was 28l. or 5l. 12s. each.

The purchasers amounted to upwards of 50, amongst whom were several, that a few years before, were the most violent, and loudest exclaimers against any "change or innovation," in the established breed of the country.

Breeding Sheep—of the long-woolled kind, to be sold to graziers

graziers to fatten, is practised by the occupiers of such farms as do not afford a sufficiency of turnips, or such as do not produce any: those who are in the latter predicament, either take turnips for wintering their hogs, or put them upon good old grass pastures. The wethers are generally sold in September and October, being then shearlings, for, from 22s. to 26s. each; and the ewes three and a half years old, from 18s. to 24s. each; in 1796, they were as high as 2l. each.

There are few or no sheep bred in those parts of the county, called Castle-Ward, Bedlingtonshire, and the south-east corner of Morpeth Ward.

The modern maxims of breeding were introduced into this county by one of Mr Bakewell's first disciples, upwards of 30 years since; previous to which, "*big bones*" and "*large size*" were looked upon as the principal criteria of excellence, and a sacred adherence to the rule of never breeding within the canonical degree of relationship; but those prejudices are at this period, in a great measure, done away; and the principal farmers of this district may now be classed amongst the most scientific breeders in the kingdom, who have pursued it with an ardour and unremitting attention that have not failed of success.*

Salving—was formerly universally practised, and it was thought the sheep could not do well without it. In the lower districts it is now almost totally disused; and some of the hill farmers have laid it aside, and find their flocks do equally well as before; and the wool sells for a much better price than when it is salved; but it is of less weight,

* It is this knowledge of breeding, and the nice discrimination of selecting proper stock for grazing, added to their improved mode of cultivation, that gives them a celebrity of character, for their extensive knowledge in rural affairs, and that has for some years back made this district a *School for Agriculture*, where pupils from various parts have come to be instructed.

as may be naturally expected, from the want of near $\frac{1}{2}$ of a pound of salve upon each fleece.

This salve is composed of 12 lb. of butter, and 4 quarts of tar, mixed well together while warm, which quantity serves 24 sheep, the number a man will salve in a day.

Milking.—It used to be a general practice through all this county to milk ewes after the lambs were weaned, for six, eight, or ten weeks; from this milk great quantities of cheese were made, and sold for about 3d. per pound. When kept to three or four years old, it is exceedingly pungent, and on that account some people prefer it to cheese of a much better quality.

To milk ewes two or three times after the lambs are weaned is a useful practice; but when continued to eight or ten weeks, it becomes very detrimental, keeps the ewes lean, and ill prepared for meeting the severities of Winter.

This custom has been long disused by the intelligent farmers in the lower districts; and we are glad to find it much laid aside by the most considerable hill farmers. The profit of milking ewes for six or eight weeks is estimated at 8d. per ewe; and it is generally agreed they are decreased in value, at least 1s. 6d. per head; of course there is a loss of about 1s. per head by milking. In one instance of milking long-woolled ewes, last Summer, there was a loss of at least 3s. per head.

SECT. 3.—*Horses.*

The best draught horses used in this county are brought from Clydesdale, in Scotland; they are in general from 15 $\frac{1}{2}$ to 16 hands high; strong, hardy, remarkable good and true pullers; a restive horse being rarely found among them.

Those bred in the county are of various sorts, descended from stallions of different kinds, from the full blood racer,

racers, to the strong, heavy, rough-legged black. From the full blood stallions and country mares, are bred excellent hunters, road and carriage horses; and from the other kinds of stallions are bred the draught horses, which in general, are middle sized, active animals, well adapted to the husbandry of the country.

We have before observed, that since the price of horses had been so very high, several oxen had been used for the draught; but whether with propriety or advantage, will appear from

*A comparative Statement between HORSES and OXEN,
for the purpose of the Draught.*

BY way of preliminary it will be necessary to admit as data, That a horse which eats 70 bushels of oats per year, will not consume of other food so much as an ox that gets no corn;* but in the following estimate, we shall al-

* This is deduced from the following experiments.

Three working horses about 15½ hands high, eat in 14 days, 96 stones of hay; which is for each horse at the rate of 16 stones a week, with an allowance of oats, 12 gallons per week.

Mr Thompson's of Chillingham Barns, 18 horses in 12 days, eat 430 stones of hay; which is 14 stones per week, each horse: allowance of oats, 16 gallons per week.

Mr Atkinson's of Yevering, eat per week, 13 stones of hay, 2 bushels of potatoes, and 16 gallons of oats.

Mr Jobson's of Newtown, 5 years old working oxen, with a full allowance of hay, had, each ox, 6 quarts of oats per day.

In 15 days 4 oxen eat 164 stones 7 lb. of hay, which is after the rate for each ox, of hay 19½ stones per week.
of oats 10½ gallons ditto.

Three days after, the same oxen were put to hay only; and in 7 days eat 79 stones 10 lb. or 20 stones each ox per week, which is only ½ stone more, than when they got 10½ gallons of corn, in the same time. This is a singular circumstance, and deserving of further investigation.

An unworked ox, 3½ years old, was put to good old meadow hay, the 29th of November, and eat 49 stones in 21 days; or per week, 16 stones 5 lb.

An idle horse (15½ hands high) eat of the same hay, 20 stones in 10 days; or per week, 14 stones—had no corn.

low

low horses to eat as much as oxen, as the difference is not yet sufficiently ascertained.

That the oxen are yoked at 3 years old, and are worked till six; and for the first year require 8, to do the work of 2 horses; but after having been worked a year, and become tractable and stronger, 6 are equal to 2 horses, either by being yoked three at a time, or two, and driven by the holder with cords; of course, the expence of a driver may be estimated to be saved for one half the year.

That the expences of a ploughman, the plough and other articles that are the same in both teams, need not be taken into the account.

And that oxen, to work regularly through the year, cannot work more than half a day at a time.

Expence of an ox per ann.

	£.	s.	d.
Summering, — Grafts 2 acres, at 20s. per acre	2	0	0

	£.	s.	d.
Wintering, — on straw & turnips	2	0	0
but if on hay	-	-	4 0 0

The average is*	-	-	3 0 0
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Interest at 5 per cent, for price of the ox	-	0	10 0
---	---	---	------

Harness, shoeing, &c.	-	-	0 15 0
-----------------------	---	---	--------

			6 5 0
--	--	--	-------

Deduct for the increased value of an ox for 1 yr.	1	0	0
---	---	---	---

gives the expence per ann. of an ox for the team	5	5	0
--	---	---	---

And the expence of 6 oxen	-	-	31 10 0
---------------------------	---	---	---------

To which must be added the expence of a			
---	--	--	--

Carried over	31	10	0
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A great portion of the soil of this county is improper for turnips; in those districts hay is given, instead of turnips, for which reason we have taken the average.

driver

	£.	s.	d.
Brought over	31	10	0
driver for $\frac{1}{2}$ a year	-	3	10
Total expence of a team of 6 oxen	-	35	0

An 8 ox team:

	£.	s.	d.
The expence of an ox per ann. being	-	5	5
			8
That of 8 will be	-	42	0
To which, add the expence of a driver	-	8	0
gives the expence per ann. of an 8 ox team		50	0

Therefore the expence of a team of oxen

	the first year, will be	-	50	0	0
ditto	the second year	-	35	0	0
ditto	the third year	-	35	0	0
	divided by	-	3		120
					0
					0

Gives the average expence per ann of an ox

team, from 3 to 6 years old	-	-	40	0	0

Expence of an horse per ann.

	£.	s.	d.
Summering, — Grass 2 acres, at 20s. per acre	2	0	0
Wintering, — Straw 13 weeks, at 9d. per week	0	10	0
Hay 16 ditto, $1\frac{1}{2}$ tons, at 2l. per ton.	-	3	0
Corn (for a year) 70 bushels of oats, at 2s. per bushel	-	7	0
Shoeing and harness	-	1	0

Carried over 13 10 0

Annulity

	£.	s.	d.
Brought over	13	10	0
Annuity to pay off 25l. in 16 years, the purchase value of the horse at 4 years old*	2	5	0
	15	15	0
Expence of a horse per ann.	-	-	-
	15	10	0
Ditto of a two horse team	-	-	-
	31	10	0

If a three horse team be used, the account will stand thus:

	£.	s.	d.
The expence of an horse per ann. being	-	15	15 0
			3
That of 3 will be	-	47	5 0
To which, add the expence of a driver	-	8	0 0
gives the expence of a 3 horse team	-	55	5 0

If the comparison be made with the horse team of many of the midland counties, where they use 5 horses, yoked one before another in one plough; the account will stand thus:

	£.	s.	d.
The expence of one horse per ann. being	-	15	15 0
			5
Carried over	78	15	0

* This is calculated on the supposition, that a horse bought at 4 years old, will work 16 years; and admitting his price to be 25l. then the question will be, to find what annuity will pay off 25l. in 16 years, allowing compound interest at 5 per cent, which by the rules laid down by the writers on algebra, will be 2l. 5s. 0d.

That

				£.	s.	d.
That of 5 will be	-	-	-	78	15	0
To which add the expence of a man to drive				18	0	0
The expence of a team of 5 horses will be	-			96	15	0
Ditto	of 3 ditto	-	-	55	5	0
Ditto	of 2 ditto	-	-	31	10	0
Ditto	of 8 oxen	-	-	50	0	0
The average expence of an ox team, from 3 to 6 years old, that will do the same quantity of work as 2 horses	-	-	.	40	0	0

The conclusions to be drawn from the above statement are so obvious as to need little elucidation; but we cannot help remarking, how strong the force of prejudice must be, to continue the use of 5 horses, and heavy, clumsy, unwieldy *wheel ploughs*, where a simple *sawing plough*, and 2 horses yoked double, and driven by the holder, would do the same quantity of work, equally well, and at one third the expence!

But before any proper conclusions can be drawn whether *ox teams* or *horses* are the most eligible, it will be necessary to consider, whether the quantity of land employed in supporting those animals be used in the most profitable mode to the community, as well as the occupier.

With the latter, the first question for consideration is, whether 8 oxen used in the team, or in grazing, will pay him the most money?

Suppose 8 oxen, at *three years old*, were put to the plough, and plough 6 acres per week; which, at 3s. 4d.* per acre, is 20 shillings; and if they work 48 weeks in a year, then their whole earnings (after deducting 6l. for

* If to this 3s. 4d. be added 1s. 8d. the wages for the ploughman and driver, it will make 5s. the usual price for ploughing an acre in this district.

expences of harness, shoeing, &c.) will be 42l.: but if they plough only 5 acres per week, (which is probably nearer the truth), then their whole earnings will be only 34l.

The same oxen put to graze, to pay the same money, should improve in value 5l. 5s. each, in the first case; and 4l. 5s. in the latter: but we are inclined to believe, there are few situations, if the cattle are of a good quick feeding kind, where they would not pay *considerably more*.

In respect to the community, the account will be nearly as follows:

From the above statements, we find that an ox for summering and wintering, requires	-	3½ acres;—
therefore a 6 ox team will require	-	21 ditto
And 2 horses for grass and hay per		
ann. require	- - -	7 ditto
For corn & straw	- - -	4 ditto
Land necessary for keeping 2 horses		
per ann.	- - -	11 ditto

The difference is the quantity of
 land required for a team of oxen } - 10 acres
 more than horses.

Hence it appears, that a team of 6 oxen requires 10 acres more land to maintain them than a team of 2 horses, which will do the same work: and of course, the produce which might be derived from this 10 acres, is lost to the community: suppose it be one half in grass, and the other half in ploughing, then we shall have,

- 5 Acres of clover, or grass.
- 1½ Ditto of oats.
- 1½ Ditto of turnips, or fallow.
- 1½ Ditto of wheat.

It would then send to market yearly, at the lowest computation,

7½ Cwt. of beef.
8 Quarters of oats.
And 5 Ditto of wheat.

From this view of the subject, it appears, that if oxen were universally used for the draught, in the room of horses, there would be a considerable defalcation in the supply of the markets, both in corn and animal food.* And the loss to the farmer would be the profit derived from the produce; which by the usual mode of allowing one-third for the farmer's profit, would in this case be about 10l.

SECT. 4.—Swine.

The *Berkshire* pigs, and the large *white breed*, were formerly the most prevalent in this county; but the small *black Chinese breed* has in a great measure supplanted them, especially upon the large farms; and these are likely to give way to a small white breed lately introduced, remarkably quiet, inoffensive animals; on which account they are principally preferred to the Chinese breed.

* In this county it is estimated that there are capable of cultivation, 800000 acres; and allowing $\frac{2}{3}$ of this to be in tillage, that is 266666 acres; and that every 50 acres in tillage will require a team to manage it properly; of course there will be at least 5333 teams, but for the sake of round numbers call it 5000 teams.

Then 5000 X 7½ cwt. beef =	37500 cwt. beef at 30s.	56250
5000 X 8 qrs. oats =	40000 qrs. oats at 16s.	32000
5000 X 5 qrs. wheat =	25000 qrs. wheat at 40s.	50000
		£. 138250

The value in provisions that would be lost in this county yearly, if horse teams were abolished, and oxen used in their stead.

SECT. 5.—*Rabbits.*

Rabbits are found in considerable numbers among the sand hills along the coast, and are probably the most eligible stock for such situations, having been sold of late years for 2s. per couple.

SECT. 4.—*Goats.*

Goats—are kept in small numbers, on many parts of the Cheviot hills, not so much as an object of profit, but the shepherds assert, the sheep flocks are healthier where a few goats depasture. This probably may be the case, as it is well known, that goats eat some plants with impunity, that are deadly poison to other kinds of domestic animals.

The chief profit made of these goats, is from their milk being sold to invalids, who come to Wooler in the Summer season.

SECT. 7.—*Poultry.*

Poultry,—in a district like this, where they are sold so low, are the most unprofitable stock kept upon a farm; the value of the corn consumed by them, being generally double to what they are sold for; and the labouring people are so well convinced of their inutility, that they constantly and universally sell them, knowing from experience, that if the value received for them be laid out in either beef or mutton, it will be much more serviceable; and this piece of economy is so well understood, that we believe there is scarce an instance of a labouring person ever making use of poultry for his own family; they are always considered as articles *purposely bred to pamper luxury.*

CHAPTER XIV.

RURAL ECONOMY.

SECT. 1.—*Labour, &c.*

THROUGH the greatest part of this county, and especially upon the large farms, there are very few servants kept in the house; seldom more than two men and two maids: but the ploughman, carters, barnmen, shepherds, &c. have each a house and garden or yard to themselves, and are generally married. The conditions of servitude for one year are:

	<i>£.</i>	<i>s.</i>	<i>d.</i>
2 Cows kept, or money in lieu at 3 <i>l.</i> each,	6	0	0
3 Bushels of wheat - at 5 <i>s.</i> per bush.	0	15	0
33 Ditto of oats - - at 1 <i>s.</i> 8 <i>d.</i> ditto -	2	15	0
12 Ditto of barley - at 2 <i>s.</i> 6 <i>d.</i> ditto -	1	10	0
12 Ditto of rye - - at 3 <i>s.</i> 4 <i>d.</i> ditto -	2	0	0
10 Ditto of pease - - at 3 <i>s.</i> 6 <i>d.</i> ditto -	1	15	0
24 lb. of cast wool - at - 6 <i>d.</i> per lb.	0	12	0
1 Bushel of potatoes planted, a pig tethered, keeping hens, &c.	2	4	0
Carriage of coals, six cart loads, - - -			

In all 18 11 0

They are bound to find a woman labourer to work for the following wages: for harvesting 6*d.* per day, for hoe-

L

ing

ing turnips,* hay-making, scaling, weeding corn, &c. used to be 4d. per day, but was last year raised to 6d. per day.

In addition to the above conditions, the shepherd generally has as many sheep kept as are worth four or five pounds a year; but, if he has any under-shepherd to keep to assist him, the number is increased accordingly. In the hilly districts, their sheep sometimes amount to hundreds, besides six or eight neat cattle.

An overseer or head servant has, in addition to the above, as much money as to make his place worth from 20l. to 30l. a year.

Threshing is mostly done by the piece; a twenty-fifth part of the corn threshed, being the general custom, if the straw be taken away unfolded; but if the thresher folds the straw, he has a twenty-first part, and finds a woman to dress the corn, and to work at all other work, for the same wages as the others; he has straw for his cow in Winter, but pays for her Summer's grass.

The yearly wages of house servants are, for men, from 8l. to 12l.; for women, 3l. to 5l.

The wages of day labourers, without victuals or any allowance of beer, are,

			s.	d.	s.	d.
For Men, in Summer,	-	-	1	2	to 1	4†
Winter	-	-	1	0	to 1	2
Harvest	-	-	1	6	to 1	9
Women, ditto	-	-	1	0	to 1	3

* In this branch of labour, the women in the northern parts of the county excel: the writer of this note has at different times visited *Norfolk*, *Suffolk*, and all the principal turnip districts in the island; but never saw turnips so well boed, and compleatly cleaned, or kept in such garden-like culture, as on these borders.

† In 1796, the wages got up to 2s. and in harvest to 2s. 6d, for men; and for women, to 1s. 9d.

for

	s.	d.	s.	d.
— for other work - - -	0	6 to 0	8	
Masons - - - - -	1	8 to 2	0	
Carpenters - - - - -	1	6 to 2	0	

Upon some of the large farms, a carpenter and smith are hired by the year.

The hours of working are from six in the morning to six in the evening, when the length of day will permit, with the following intervals of rest:

	H.	M.
At breakfast - - -	0	30
Ten o'clock - - -	0	30
Dinner - - - - -	1	30
Four o'clock - - -	0	30

In all 3 00 hours of rest, and nine of labour.

SECT. 2.—Provision.

The price of grain in this county fluctuates very much: betwixt the markets of Newcastle and Hexham, and those of Alnwick, Berwick, and Wooler, there is always a considerable difference;* the prices in the northern parts being in general the lowest, or amongst the lowest, in the kingdom, owing to the produce being so much greater than the home consumption. This surplus affords large quantities to be yearly exported from Berwick, Alnwick, and other places along the northern part of the coast.

The average prices of grain at Berwick, in 1792, were,

	s.	d.
Wheat - - -	5	0 per bushel.
Rye - - -	3	4 ditto

* Wheat and barley, in Newcastle market, are mostly sixpence a bushel higher; and in Hexham, nine-pence.

		<i>s.</i>	<i>d.</i>	
Barley	- -	2	6	ditto
Oats	- -	2	2	ditto
Pease	- -	3	6	ditto

Fat stock being easily driven from one place to another, keeps the price of butcher's meat more upon an equality in all the markets of the county.

The average price of butcher's meat is from threepence-halfpenny to fourpence-halfpenny per pound; but in May and June it generally gets to fivepence, and the two last years has been sixpence and sevenpence.

		<i>s.</i>	<i>d.</i>	
Butter	- -	0	6	a pound of 16 ounces.
Skim-milk and ewe cheese	- -	0	3½	ditto
Fat goose	- -	2	0	
Turkey	- -	3	0	
Duck	- -	0	8	
Chicken	- -	0	6	<i>s. d.</i>
Eggs, per dozen	- -	0	3	to 0 6
Potatoes, per bush.	- -	1	0	to 1 6

SECT. 3.—Fuel.

Upon the edges of the moors, towards the western parts of the county, a few peats are burnt; but in every other part, we believe, coals are universally used.

The quantity consumed by a poor family, is from 5 to 7 cart loads a year.

CHAPTER

CHAPTER XV.

POLITICAL ECONOMY.

SECT. I.—*Roads.*

THE turnpike roads are mostly in good order; those that have an opportunity of getting whinstone, or limestone, are the best; but they certainly would be better if the surveyors would order the stones to be broken smaller and the roads made wider. One great objection to some of these roads is the many steep banks they are disgraced with, some of the worst might have been avoided; but it seems the original setters-out of these roads had a predilection for climbing and descending steep banks: this is notorious on both the roads upon Rimside-Moor, without even the plea of being nearer; as the leveller road would have been nearer, travelled in much less time, and with far less fatigue. Some similar cases appear on the post road, which we hope will be remedied in the next application to Parliament for a new act.

The township roads are in some places good, but by far the greatest part are deserving of a different appellation; the cause of this deficiency is in most cases to be attributed to the neglect and manner of performing the statute-work.

One mode of remedying this neglect, would be to appoint a surveyor, with a small salary, who should be empowered to collect the composition due for statute-work,

and employ this money for repairing the road where *most necessary* for the *public in general*, without having regard to the convenience or influence of individuals.

A book should be kept by the surveyor, and yearly examined, settled, and signed by a committee of inhabitants, before it went to the magistrates. We know from experience, that by this means the road would be much better made, and in near double the quantity: for when a farmer sends his cart to perform statute-duty, it seldom carries more than half a load, and the servants practise every manœuvre to put off time, and do as little as possible, which would not be the case with hired carts, as every inhabitant would be ready to report any mal-practices.

SECT. 2.—*Canals.*

In this county there are no Canals; and notwithstanding their manifest utility to a district like this, where such immense quantities of heavy articles are to be conveyed; yet we believe, no attempt was ever made, or even so much as a canal projected, in any part of the county before 1792, when some gentlemen on Tweedside had it in contemplation to make a navigable canal, from the collieries and lime works near Berwick, to Kelso in Scotland, and from thence up the Tweed and Tiviot; but a survey being made by Mr Whitworth, it was dropt, probably on account of the great expence.

The next public notice we can trace, was given by Mr Dodd, in 1794, of a canal from Newcastle to Carlisle, or Maryport, in Cumberland, to join the east and west seas. This was to pass on the *south side* of Tyne: but Mr Chapman proposed a line to pass on the *north side* of Tyne, the peculiarity of which was, that it should come from Haydon-Bridge, to the *upper parts* of Newcastle, upon *one level without a lock*, and the goods conveyed from thence

to

to the river, either by a kind of stair-case of locks, or in waggons on an inclined plane. By this proposal, the principal supporters of the grand canal were divided into two parties; the consequence of which was, that the money to compleat the great design of uniting the two seas, could not be raised, and of course it was given up; one on the north side, proposed to stop at *Haydon-Bridge*, and another on the south side at *Hexham*. The subscriptions for defraying the expence of the north line, we were informed were filled; and application was made to Parliament in 1797, to obtain an Act for making a canal on the north side, but it met with so strong an opposition from the land owners, that it was thought proper to withdraw it.

The subscribers for a canal on the south of the river still persevere in their endeavours to accomplish the line to *Hexham*, or *Haydon-Bridge*; and we have not heard that any opposition to the measure is intended by the proprietors of lands, through which it is to pass.

SECT. 3.—*Fairs.*

The principal Fairs in this County are:—

MAY

4th.—*Wooler*—for a few cattle, sheep, horses, hiring servants, &c.

10th.—*Alledale*—for cattle.

12th.—*Alnwick*.—A large show of both fat and lean cattle.

14th.—*Haltwhistle*—for cattle, chiefly cows for grazing.

JUNE:

Tuesday before } *Belford*.—A few cattle and sheep.
Whitsuntide. }

Wednesday before } *Morpeth*—for fat cattle, sheep, &c.
Whitsunday. }

Whitsun Eve.—*Stagshaw-Bank*, (near Corbridge)—for cattle, sheep, horses, &c.

Whitsun-Tuesday—*Whitsun-Bank*, (near Wooller.)—A large fair for cattle, horses, and great numbers of sheep, principally long-woolled hogs, and ewes and lambs; and a hiring for servants.

Friday in Trinity } *Berwick*—a few lean and fat cattle.
week.

JULY

4th.—*Stagshaw Bank*, (near Corbridge.)—This is one of the largest sheep fairs in the north of England; principally of the black-faced heath sheep, which mostly come from the south west of Scotland: there are also great numbers of cattle, horses, and swine.

Wednesday be- } *Morpeth*—for fat cattle, sheep, &c.
fore the 22d.

Last Monday, — *Alnwick*,—fat and lean cattle.

AUGUST

5th.—*Hexham*.—Cattle, horses and sheep, chiefly lambs, both of the Cheviot and heath kind; from the vicinity of *Langholm*, (in Scotland.)

12th.—*Newcastle*—holds 9 days for horses; and for fat and lean cattle, on the last or 12th.

23d.—*Belford*.—A few cattle and sheep.

24th.—*Whittingham*,—for fat and lean cattle, and a few horses. The best show of fat cattle of any fair in the county.†

26th.—*Elfdon*,—a few cattle.

SEPTEMBER.

Saturday af- } *Bellingham*,—a few cattle, chiefly small
ter the 15th } cows.

* Upwards of a hundred thousand sheep are shown at this fair.

† This fair used to be held on the 4th of September, but was altered a few years since.

19th. — *Harbottle*, — for a few cattle, mostly steers and heifers.

27th. — *St. Ninians*, (near Wooler). — a very large show of sheep and cattle, with a few horses. — The sheep are mostly draft or cast ewes, and shearing wethers.

OCTOBER.

First Tuesday — *Alnwick* — for fat and lean cattle.

2d. — *Rothbury*, — for cattle, mostly for steers and heifers.

17th. — *Wooler*, — for very great numbers of sheep, of the Cheviot and long-woolled kinds: a few cattle and horses.

29th. — *Newcastle*, — for horses, cattle, and swine.

This is one of the largest fairs in the north of England. The horse fair begins nine or ten days before the 29th, and continues every day in the town, where great numbers of remarkable fine horses, for the field, the road, and the carriage, are sold daily. The abundant choice of every kind, brings great numbers of dealers from London and various other distant places: its celebrity has increased very much of late years, and we believe it may be justly classed amongst the first horse fairs in the kingdom.

The show of cattle is also very great, not only for the breed of the country, but also for large droves of kyloes, (Scotch cattle) which are purposely driven from the Highlands, to be sold at this fair. — The fair on the 29th, is held on the Town-moor, and is called the *Cow-hill fair*.

NOVEMBER.

1st. — *Rothbury* — for young cattle.

8th. — *Hexham*. — Cattle.

14th. — *Allendale*. — Cattle, mostly small cows.

22d. — *Newcastle*. — Fat cattle, chiefly cows: this fair is held in the town, and is called the "*Stones fair*."

22d. — *Haltwhistle*. — A few fat cows, and lean cattle for wintering.

SECT. 4.—*Markets.*

Tuesday.—*Hexham*,—for corn and other provisions.

Ditto—*Belford*.—The chief support of this market, is the sale of corn, great quantities of which are sold by sample, for exportation.

Ditto.—*Newcastle*,—a small market for provisions of various kinds.

Wednesday.—*Morpeth*,—for corn, butcher's meat, butter, &c. and for fat cattle and sheep: of the former on an average not less than 80 weekly; and of sheep, and lambs 1600;* which are bought up for the consumption of Newcastle, Shields, Sunderland,† &c.

Thursday.—*Wooler*,—principally for corn, considerable quantities of which are sold by sample, mostly for exportation.

Friday.—*Rothbury*.—This market is little more than nominal, there being only one butcher who sells a few carcases, and which constitutes nearly the whole of the market.

Ditto.—*Allendale*,—for corn, butcher's meat, and considerable quantities of potatoes and garden stuff from Hexham; all for the supply of the mining district to the westward.

* Mr Thomas Spours, who has attended this market for upwards of 40 years, says, that 30 years since, there was not half this number; and he remembers, that for several weeks in the Winter, very few sheep or cattle, if any, were exhibited.

† It may be proper to remark, that 30 or 40 years since, the butchers of those places were obliged to purchase a great deal of fat stock, in the neighbourhood of Darlington, and other parts of the county of Durham; the produce of the north not being equal to their demands: but the scales are now turned, the northern farmers being able, not only to supply the increased population of those places, but to send great numbers of both fat cattle and sheep, every year, to Leeds, Wakefield, Manchester, &c.

Saturday

Saturday.—*Newcastle*.—A very large market, and well supplied with corn, butcher's meat, fish, poultry, butter, &c.

Dr Hutton, in his Plan of Newcastle, in 1772, states the annual consumption of this place to be 5000 cattle, 10000 calves, and 147000 sheep and lambs.

Ditto.—*Alnwick*,—a large market for corn and provisions of various kinds.

Ditto.—*Berwick*,—for corn, butcher's meat, and other articles of provisions; at both this market and Alnwick, considerable quantities of corn are sold by sample for exportation.

SECT. 5.—*Commerce.*

The commerce of this county is derived principally from the coal trade: the ships belonging to the port of Newcastle, in 1772, are stated by Mr Pennant, to be 3948, their tonnage, 758214.—The principal exports are coals, lead, lead shot, wrought iron, grindstones, pottery, glass, &c.

The exports from Berwick, are chiefly corn, flour, oatmeal, shelled barley, potatoes, fish, eggs, wool, &c. coastways; which has increased very much of late years; the foreign trade is chiefly to the north of Europe.

The number of vessels belonging to this port is about 40, making upwards of 3000 tons: the receipts of the customs are, upon an average, about 3000l. per ann.

The port of Alemouth also employs a few vessels in exporting corn, flour, &c.

And a few vessels are employed in the Summer season, in carrying lime, from the neighbourhood of Bambro', to different parts of Scotland.

SECT. 6.—*Manufactures.*

This county is not distinguished by any staple manufactures;

factures; the principal are derived from, or connected with the coal trade and mines; as ship-building, roperies, forges, founderies, copperas, coal tar, soda, or marine alkali, white lead, potteries, glass works, &c.

Hexham has been long famed for its manufacture of gloves, which employs about 300 hands.

To establish *manufactures of Woollens*, two or three essays have been lately made at Alnwick, Mitford, and Acklington; and a cotton Mill has been lately erected at Nether-Witton; all of which, from present appearances, we hope are doing well.

There is one species of manufacture carried on in this district, with an agricultural production of small value, viz. that of straw, which is not only made use of as a covering for the heads of the wives and daughters of the humble cottager, but has also lately been converted into ornaments that might accompany the richest and most splendid dress, which the palace or the drawing-room exhibits; and, for the honour of the plough, has not only been converted into buttons for the men, but also into rings and ear-rings for the ladies.

Agriculture is certainly benefited by manufactures in the consumption of its produce, by the great number of people employed: but we do not find any new modes of practice or improvements in agriculture, introduced in their vicinity, or resulting from the exertions of those connected with them.

SECT. 7 — *Poor.*

We do not find any mode of managing the poor in this county, different from that generally used in other districts.

In those townships where they are collected and maintained in poor houses, the rates are easier, than where they are relieved at their own houses. We are inclined to believe

lieve that work-houses, under proper regulations, would not only considerably lessen the rates, but the poor might be supported more comfortably.

SECT. 7.—*Population.*

Of the population, we could not collect sufficient data, from whence even a tolerable guess could be made.

CHAPTER XVI.

OBSTACLES TO IMPROVEMENT.

IN our journey through this county, wherever we enquired what was the chief obstacle to improvement? the answer was universally, "*Tithes!*"—An imposition so pregnant with mischief, and so often the source of violent dissensions betwixt the clergy and their parishioners, should if possible be removed, either by purchase, commutation, or any other means, by which a *fair equivalent* shall be rendered for them: for so long as they exist, it is impossible to expect that agricultural improvements will be carried on to the extent of which they are capable. In our Survey of Cumberland, we have shewn the great uncertainty of employing money in speculations of improving land; and that the tithes, in such cases, are a large portion of a man's capital in trade, and not a tenth of the natural produce of the earth, which some have thought was all that was intended by the original imposers, who no doubt meant them for a good purpose; but if through a succession of ages, a change of manners, of sentiments, and

and of cultivation, has taken place, and the ill effects of tithes be universally felt, and acknowledged to lessen the quantity of food obtainable from a considerable portion of this kingdom, a change in the mode of paying tithes would also be desirable; for the proprietors of such lands are not only losers, but the community at large. It is surprising that a grievance of such magnitude should have so long evaded the revision and regulation of the legislature; and that it should be always so strenuously opposed by the clergy, there being no wish to take any thing from them, but to render a *fair equivalent* for what is their due; and which there would be little difficulty in doing, notwithstanding the many objections that have been invented, to perplex this most interesting question.

CHAPTER XVII.

MISCELLANEOUS OBSERVATIONS.

SECT. 1.—*Agricultural Societies.*

THERE never was any Agricultural Society in this county; and if any ever had existed, it probably would have been soon dissolved, if we may judge from the experiments that have been made in some neighbouring districts, where we find, that after a few years continuance, they have been given up; but whether from a radical defect in the institutions, the non-attendance, and indifference of members, or the *injudicious distribution of prizes*, we are not prepared to say; but think that public farms are much more likely to promote improvements in the Science of Agriculture.

SECT.

SECT. 2.—*Weights and Measures.*

Weights and measures—are in a sad state of confusion; a pound, a stone, a bushel, a boll, are rarely the same in different markets, and frequently vary in the same market for different articles.

At Newcastle.

4 Beatments	-	-	1 Peck
2 Pecks	-	-	1 Kenning
2 Kennings	-	-	1 Bushel, <i>Winchester.</i>
2 Bushels	-	-	1 Boll.

At Hexham.

For Wheat, Rye, and Pease.

4 Quarts	-	1 Forpit
4 Forpits	-	1 Peck
4 Pecks	-	1 Bushel
2 Bushels	-	1 Boll, = 4 <i>Winchester bushels.</i>

For Oats and Barley.

4 Quarts	-	1 Forpit
5 Forpits	-	1 Peck
4 Pecks	-	1 Bushel
2 Bushels	-	1 Boll, = 5 <i>bushels, Winchester.</i>

At Alnwick.

3 Quarts	-	1 Forpit
4 Forpits	-	1 Peck
3 Pecks	-	1 Bushel, <i>Winchester.</i>
2 Bushels	-	1 Boll of Wheat.
6 Bushels	-	1 Boll of Barley or Oats.

At Wooler.

4 Quarts	-	1 Forpit
3 Forpits	-	1 Peck
3 Pecks	-	1 Bushel
6 Bushels	-	1 Boll

A stone of wool in some parts is 24 lb. in others 18 lb. ; and a stone of every other article is 14 lb.

The Board of Agriculture could not do the public a greater service, than by bringing forward a regulation of weights and measures. One weight, and one measure, derived from the same root, and increasing or decreasing in a ten fold ratio, would introduce such simplicity, ease, and perspicuity, into all transactions of business, (where calculations are necessary) as would prevent the numberless mistakes and errors which are daily happening.

Preparations for remedying this great inconvenience, have been made at different times ; and we believe there are sufficient materials for perfecting the measure, whenever it is thought proper to bring it forward.

SECT. 3.—*Vermin.*

Moles and rats—are two species of vermin which we think capable of being in a great measure extirpated, or so far reduced, as to render their depredations of little consequence. In Cumberland, a mole is rarely to be seen : this is in consequence of every occupier of land contributing his due proportion towards their destruction. A similar plan established in this county for destroying vermin, we believe, would readily be complied with by every good farmer ; and the bad ones ought not to have it in their power to injure their more industrious neighbours.

Crows—of late years, have become a very great nuisance, not only for rooting up wheat, and other grain, in a sprouting state ; but clover and potatoes, corn stacks, and young plantations, are greatly injured by them. Last Spring, a collection of sixpence a plough was made by a few farmers in Glendale Ward, for pulling down their nests. Many thousands were destroyed by this means ; and we hope the practice will be continued until they are found less pernicious.

Foxes.

Foxes—are very numerous, and very destructive to young lambs, in a district like this, where so many sheep are bred; but while they are so anxiously preserved for the chase, we despair of seeing any regulations take place for reducing the numbers of this mischievous animal.

Dogs—in every place are swarming: two thirds of them at least are kept by people who have no manner of use for them; and are constantly complaining of their inability to obtain food for their families. It would be doing these people an act of justice, to exempt them from doing statute duty on the high-ways, on condition they did not keep a dog; and to supply the deficiency by laying a tax upon dogs, which tax should be applied towards repairing the roads.*

CONCLUSION.

Review of some particular parts.

IN taking a review of the foregoing report, we find, that the minerals are of great importance to this county. In respect to the coals, it appears, that they are not inexhaustible, and in two or three centuries will probably be so far wrought out, that the metropolis will have to be supplied from other districts with this necessary article, of a very inferior quality, and at a much higher price.

The most striking parts in a view of the Agriculture, are

* Since the first edition of this report, the Legislature have thought proper to lay a tax upon a certain description of dogs, but have exempted the only ones, which are a nuisance to the community.

the great extent of farms: leases for 21 years, and the opulence, intelligence, and enterprising spirit of the farmers: but the most prominent feature, is keeping a due balance betwixt the arable and grass lands, so as always to have a large breeding live stock, especially of sheep.—Various systems of husbandry have been tried, and the boasted one of turnips, barley, clover, and wheat, has been pursued till the crops have evidently declined, particularly the turnips and clover; and the only means of restoring such lands, has been by adopting the system of three years arable, and three years grass, *depastured with sheep*, and a small proportion of cattle: by this mode, nature has time to prepare a sufficient lea-clod, which being turned up for the turnip fallow, will ensure a vigorous crop of turnips, as it is well known they always flourish upon fresh land, or where they find the remains of a lea-clod to vegetate in. It is from this circumstance, and the peculiar and excellent mode of cultivating them, that such great crops are produced, with not more than 10 or 12 *cart loads* of dung per acre: crops that are seldom worth less than 4, 5, or 6l. per acre, for the purposes of feeding cattle and sheep, have in some instances been sold for 7 and 8l. per acre. This mode of cultivating turnips in drills, is also of great importance, being much superior to the broad-cast culture, not only for the turnip crop, but for every other crop that succeeds them.

The proportion betwixt the quantities in arable and grass, varies according to the quality of the soil, and other circumstances; but in most situations it is usual to keep a certain portion of the best and richest old grazing lands, constantly in grass, as a “corps de reserve,” in case the artificial grasses fail; and on strong clayey soils, for depasturing a portion of the store flock upon in winter; for this purpose, it is necessary upon such soils, to have a much larger portion of old grass land, than upon dry loams; and

and which is generally eaten lightly in the latter part of Summer, that there may be a good aftermath, against the time the artificial grasses fail.

It is this union of stock and tillage, and pursuing the system mentioned in page 64, that enables the farmers to pay such high rents; and which keeps the land always in a *due state of fertility*, to produce the most profitable crops;* and at the same time is managed and kept clear of weeds at the least expence. The portion that is kept in grass for three years, breeds and fattens such a number of sheep, as leave a considerable profit, probably equal, if not more than the arable crops: the yearly profits of a sheep, being estimated at not less than from 20 to 30s. 6 or 8 of which, an acre of clover will fatten, and an acre of turnips about double the number.

By this system are obtained the principal advantages of folding, without any of its inconveniences; for if on an average

The 1st year's clover & grass carry 7 sheep per acre for

				20 weeks
2d. ditto	-	-	5 ditto	20 ditto
3d. ditto	-	-	3 ditto	20 ditto
and the turnips	-	-	12 ditto	20 ditto

that is - - - 27 sheep per acre, for 20 weeks, which is after the rate of 540 sheep per acre for one week *once in six years*; at the same time that the sheep are leaving, on an average, a profit of 25 shillings a year each.

* There is a certain state of fertility necessary for producing maximum crops of grain; land may be too rich as well as too poor, for growing corn: we have frequently seen crops of wheat rendered of little or no value, by the injudicious application of a few cart loads of manure per acre more than was necessary; upon lands made too rich, corn is very apt to lodge; which not only injures the crop of grain, but entirely destroys the clover and artificial grasses sown along with it.

By this means, and the lime and manure laid on the fallow turnips, or drilled beans: the lands are kept in the highest state of fertility, for producing all kinds of grain and green crops; and the profits from the sheep, we presume, are much greater, than could be obtained from the "*folding-breeds*;" by the mode of folding practised in Norfolk, and some other parts of the kingdom.

If our farms were stocked with those breeds of sheep, so much extolled for their folding properties, and managed under the folding system, we are clearly of opinion, (from having examined the various breeds,) that a very great diminution of rental would take place in a few years. But when the Northumbrian farmers are informed that the profits of a Norfolk sheep in "lamb, wool, and folding, are only from 10 to 13 shillings per year,"* we need not be apprehensive that they will adopt this practice, the remnant of a barbarous age; when the country was, for the most part, in open townfields with appendant common; but which, we hope, will give way to a more enlightened system; though this prejudice for Folding-sheep, like many others, will probably require a series of years totally to extirpate it: the misfortune is, that those who know the least about stock, are generally the most bigotted for retaining the original breeds of the country; and the loudest to raise a clamour, against innovation and attempts at improvement.

It will be proper to observe, that the sheep stock of this district has been so much improved within the last 30 years, that they can now be sold fatter at 15 months old, than they used to be at more than double that age; yet we find that the same childish arguments were used at that time, against changing the "established breed of the country," as are used by some people at this day, in favour of the worst breed of sheep in the kingdom.

* Suffolk report, by A. Young, Esq.

This improvement in the sheep stock, has been accomplished by the practice of hiring tups, at no inconsiderable prices; and which is now become so prevalent, and so many competitors have entered the lists, that we hope the spirit of emulation will not slacken, and that we shall see additional improvements every year.

Having thus taken a short review of the most striking features of the agricultural practice of this district, we shall next proceed to offer a few hints on the

Means of Improvement.

To those few who practise the system of taking two white crops to a fallow, and of continuing their land in tillage for nine, twelve, or more years, and of sowing it up with common hay-seeds, white clover, &c. and letting it continue as many years in grass, as it continued in tillage; we would recommend the system in the article *Rotation of crops*, (page 64.)

Of drilling beans and pease;—we have before expressed our surprise, that so excellent a practice should be neglected in all that extensive district along the sea-coast, where they are so much cultivated; we hope that the good sense and enterprising spirit of the wealthy farmers of this district will no longer be swayed by old customs, but will be ready to make a fair experiment, of a system which has been practised on similar soils with success, and may, in all probability, be equally beneficial on theirs. The difference betwixt a naked fallow, and a crop of beans, is too striking to need any elucidation.

Watered Meadows.—There are many parts of this county capable of deriving great benefits from this practice, especially where the waters are unmixed with vitriolic impurities, derived from their connection with coal-mines, or strata of aluminous earth. We have also our sus-

pitions of such waters as are strongly tinged by infusions of peat-moss.

Draining—is also another operation from which great advantages are to result; but they should be *hollow drains*, executed with judgment, and well secured: and not *surface drains*, a foot wide, and six or eight inches deep; such are mere *temporary reliefs* to a tenant, but no *permanent improvement*.

In the live stock of this county, there is certainly great improvement to be made, and like many other branches of science, the more we investigate the subject, the more we are convinced of its unlimited improvements: but improvements of this kind are not so easily spread as those of cultivation. If a farmer sees any modes of practice more beneficial than those he knew before, he can readily adopt them; or if he discovers and selects a new variety of any species of grain, more productive and more valuable than any hitherto known, it multiplies so fast, that it is readily disseminated; but *improved breeds of stock* are not so readily diffused; they are much slower in their propagation, and much more easily contaminated, and are only to be preserved by *attention and judgment*: when *these* become general, we may hope that improved breeds of stock will prevail over the whole county; this period is probably more distant than a true patriot would wish, but in the mean time we hope, that those who are already possessed of improved breeds of stock, will not slacken in their pursuits; that by their example, the knowledge and practice of breeding may, by degrees, be better understood, and a spirit of emulation more generally diffused. When we consider and reflect how slow that most valuable breed of sheep (now best known by the appellation of the *Disbley breed*) has spread, and how very small a part of this island they still cover, one would be almost led to think that the breeders were not blessed with the senses of seeing and feeling.

feeling — Mr Bakewell has been employed above 40 years in the important task of improving this breed of sheep, to a degree of perfection unknown at any former period ; yet it is a very few years since many of his near neighbours pursued a very different, and less lucrative species. To this day, we are pretty well informed, that more than half the large fertile county of Lincoln continue to breed a slow feeding, unprofitable kind, though adjoining the county of Leicester : which is the more to be regretted, because that county certainly produces more sheep than any other in the island, and perhaps we do not hazard too much if we assert it as our opinion, that it sends more mutton to market than any two counties in the kingdom. However, we flatter ourselves, that the labours of the Board of Agriculture will have a happy tendency towards opening men's eyes, and convincing them of the propriety of not only cultivating the ground in a more masterly manner, but of stocking their pastures with the most profitable animals.

Public Farms—in every county, conducted by proper persons, would tend more towards forwarding the perfection of Agriculture in all its branches, than any other measure that has ever been suggested ; and as the gentlemen of large landed property would be the most interested in the results of such an institution, they certainly ought to be the guardians and supporters of it. The principal expence would be at its first institution ; when once got into a proper system, it would require little, if any further aid.

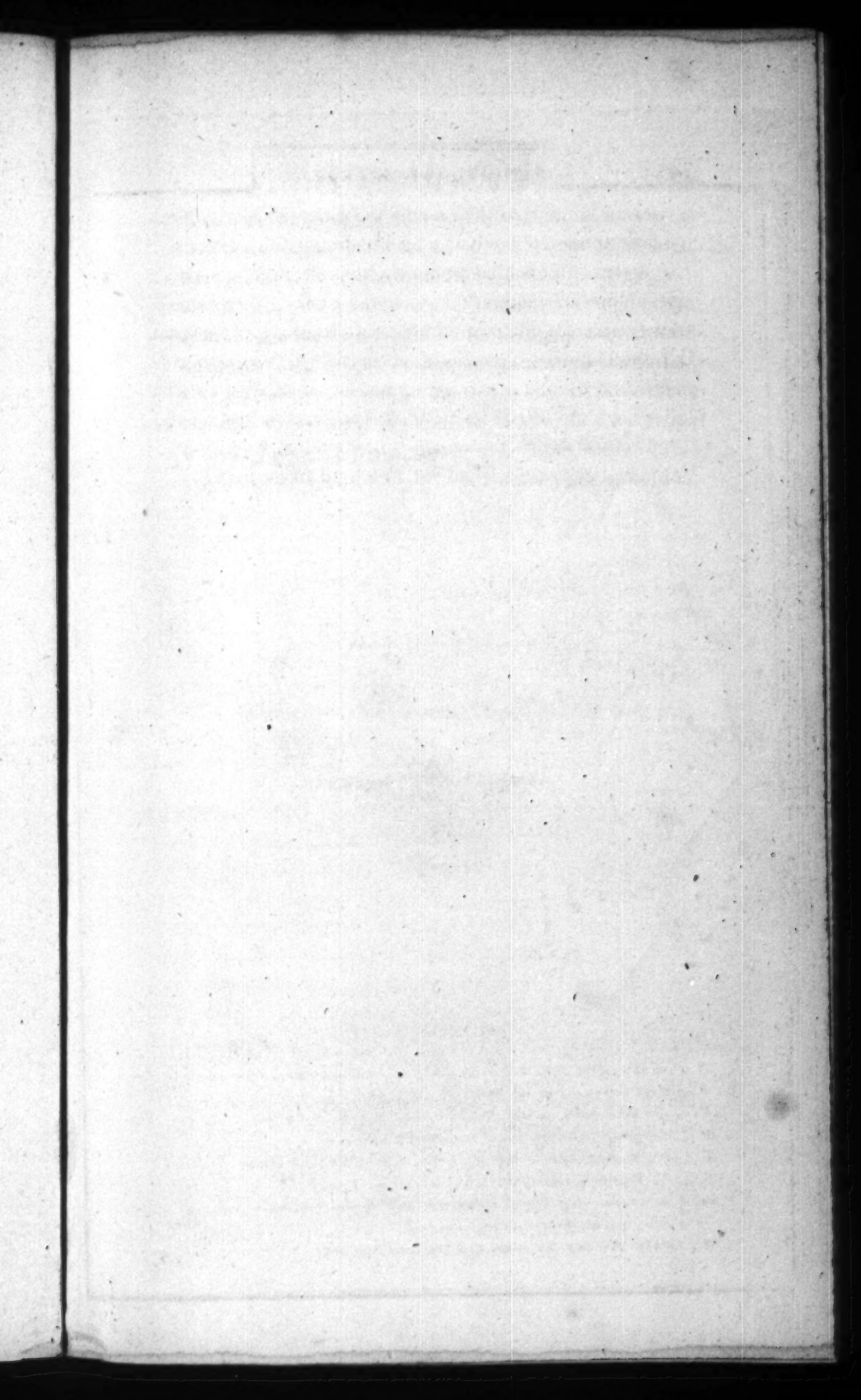
If estates of 500l. a year, and upwards, were only to contribute 10l. per thousand, yearly rent, it would, in this county, raise a sum sufficient for setting forward the undertaking. We suppose the farms to contain from 700 to 1000 acres, of various sorts of land, some mountain pastures, and an opportunity of converting a part of it into

watered meadows. We know situations of this sort that might be rented for five or six hundred pounds a-year.

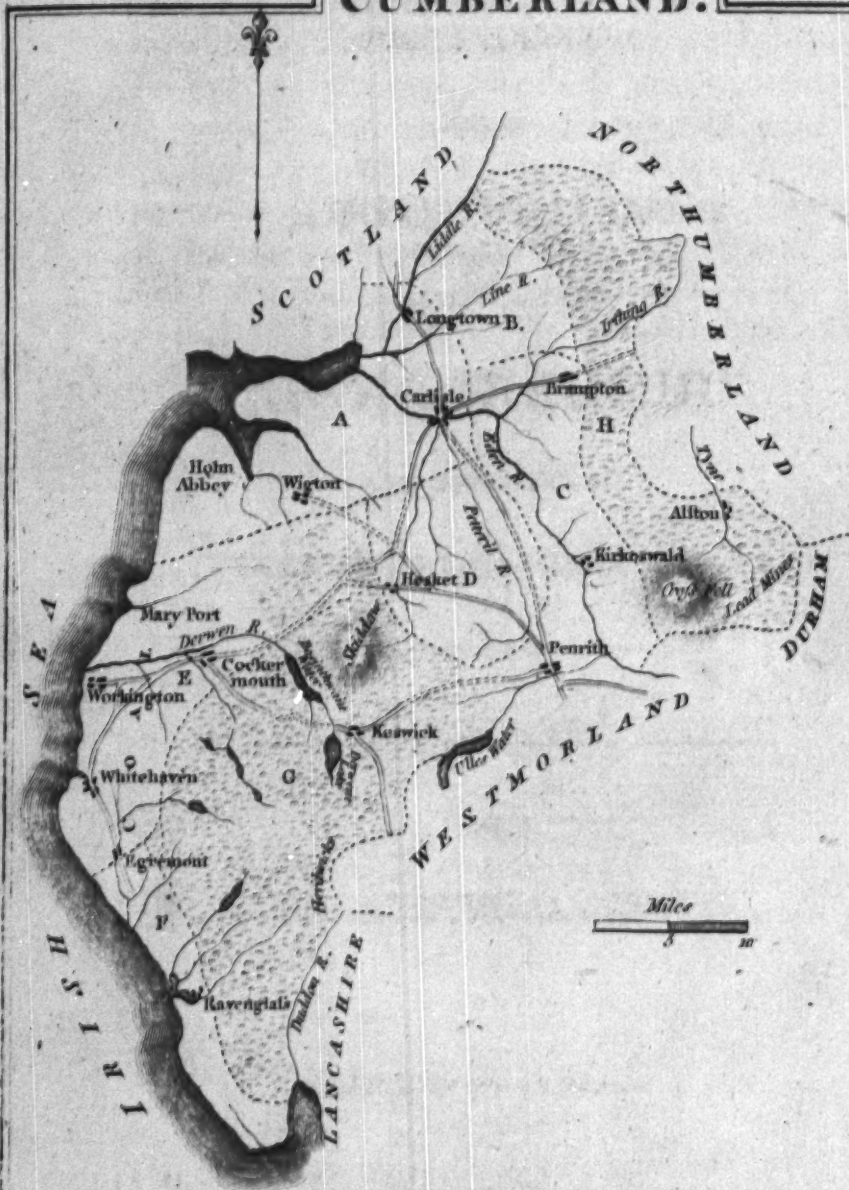
A farm of this kind would not only be a school, where youth might be instructed in agriculture; but even experienced farmers might often visit it with advantage, to learn the results of new experiments, and adopt those that promised to be useful — It would be easy to enlarge on this subject, and suggest many useful appendants to such an institution, should the gentlemen of landed property ever think of carrying a scheme of this kind into execution.



GENERAL



CUMBERLAND.



- A.....mostly a fertile clayey loam, with patches of turnip soil; no Coal nor Lime.
 B.....moist Loam, no Coal nor Lime.
 C.....dry fertile Loam; no Coal, Limestone, on the east side & S.W. Corner.
 D.....Soil various; Limestone about D. and to the westward.
 E.....D^r in many places a tight dry Loam; Coal & Lime in abundance.
 F.....D^r a great portion of dry loam, no Coal nor Lime.
 G.....mountainous rocky district, interspersed with beautiful romantic fertile
 (Vales; soil mostly dry; no Coal nor Lime.
 H.....Heathy Mountains. Soil mossy. Coal, Lime, and Lead mines.

GENERAL VIEW
OF THE
AGRICULTURE
OF THE COUNTY OF
CUMBERLAND,
WITH OBSERVATIONS
FOR THE MEANS OF ITS IMPROVEMENT;
Drawn up for the Consideration of the
BOARD OF AGRICULTURE
AND
INTERNAL IMPROVEMENT.

BY

J. BAILEY AND G. CULLEY.



" Here stupendous Alpine mountains rear
" Their rocky sides, and rushing torrents roar :
" There the smooth expansive Lake, the fertile Vale,
" And cultur'd Fields, and Gardens smile around ;
" And careless herds and flocks securely stray."

CENTRAL VUE

AGRICULTURE

CUMBERLAND

FOR THE REPAIR OF THE HIGHWAYS

BOARD OF SUPERVISORS

LETTER OF INTENT

AGRICULTURAL SURVEY

OF

CUMBERLAND.

CHAPTER I.

GEOGRAPHICAL STATE AND CIRCUMSTANCES.

SECT. 1.—*Situation and Extent.*

THE county of Cumberland is situated between the latitudes of 54 deg. 6 min. and 55 deg. 7½ min. North; and the longitudes of 2 deg. 13 min. and 3 deg. 30 min. West from London. Its length from St. Bee's Head, in a N. E. direction, to Butter Burn, is 58 miles; and its mean breadth, in a N. W. direction, is 30 miles.

It is bounded on the east by Northumberland, 51 miles

————— Durham, - 7

on the west, by the Irish Sea, - 67

on the north, by Scotland and

the Solway-Firth, - - } 30

on the south, by Westmorland, 48

————— and Lancashire, 21

Making the whole circumference, - - 224 miles

and contains 1516 square miles, or 970240 acres.

SECT.

SECT. 2.—*Divisions.*

This county is divided into five wards, viz. :—Cumberland Ward; Eskdale Ward; Leath Ward; Allerdale Ward above Derwent; and Allerdale Ward below Derwent.

SECT. 3.—*Climate.*

In a county like Cumberland, enjoying such an extent of sea-coast, and where so large a portion is occupied by mountains, and those reckoned amongst the highest in the kingdom,* the climate must be various. Along the coast, and for a considerable way up the rivers, the snow seldom lies above twenty-four hours; but upon the mountains the snow will continue for six or eight months: of course, the lower parts of the county are mild and temperate, while on the higher grounds, and upon the mountains and their vicinity, the air is cold and piercing; but the whole is healthy, though subject to great and frequent falls of rain, particularly in the Autumn, which makes their harvests very precarious and expensive. This excess of wet, we believe, is more or less the case upon the whole of the western coasts of the island.

* The highest mountains in the kingdom, are

	<i>Feet.</i>	
Benevis in Scotland, - - -	4,350	the highest in Scotland.
Benlomond, ditto - - -	3,240	
Snowdon, in Wales, - - -	3,456	the highest in Wales.
Cross-fell in Cumberland, - - -	3,400	} the highest in England:
Helvella, ditto, - - -	3,324	
Skiddaw, ditto - - -	3,270	
Saddleback, ditto, - - -	3,048	
Blackhouse heights, Selkirkshire	2,370	
Ettrick-Pin, ditto, - - -	2,200	
Carter-fell, Roxburghshire, - -	1,602	
Wharfedale, Yorkshire, - - -	1,350	
Ingleborough, - - -	1,239	

We

We have been favoured with the following Table, shewing the perpendicular height of rain that has fallen at Keswick, the last seven years; by the ingenious Mr P. Crosthwaite, owner of the curious museum there.

	1789	1790	1791	1792	1793	1794	1795
	<i>Inch.</i>	<i>Inch.</i>	<i>Inch.</i>	<i>Inch.</i>	<i>Inch.</i>	<i>Inch.</i>	<i>Inch.</i>
January	8,5	5,9	11,4	4,5	5,7	5,7	1,3
February	9,1	4,0	9,2	4,9	9,6	11,2	5,3
March	1,3	1,3	3,1	9,6	5,3	6,5	4,7
April	4,2	2,3	3,3	11,6	1,8	5,4	5,7
May	3,7	3,6	4,0	6,5	1,8	3,3	2,7
June	7,0	5,1	2,0	2,7	4,1	1,6	3,3
July	5,3	6,3	8,2	3,9	2,6	2,5	2,0
August	3,5	5,8	5,9	6,0	8,8	3,1	6,4
September	7,3	8,4	2,8	10,6	2,9	8,1	1,1
October	8,1	6,1	7,1	6,7	6,2	9,4	12,8
November	6,1	5,0	8,7	5,8	3,4	6,9	11,7
December	8,1	10,9	7,8	11,7	7,4	8,0	10,6
Total in each year	72,3	64,7	73,5	84,5	59,6	71,7	67,6

SECT. 4.—*Soil and Surface.*

The soil is various, but may be classed under four different heads.

1st. *Fertile clays*, or rather *rich strong loams*, occupy but a small portion of this county; formerly this kind of soil was generally employed in grazing, or the dairy; but since the introduction of growing wheat, it has been converted into tillage, and produces excellent crops of grain.

2d. *Dry Loams*, including the various degrees from the rich brown loam, to the light sandy soils. This is the most prevalent, occupying a greater portion of the county than any other; not only the lower districts, but the steep sides of the mountains, are in general of this soil; and in many places, even their summits are covered with a dry sound earth, producing green sward, with little
heath;

heath: we suppose at least one half of the lower, or cultivatable district, is of this valuable soil, excellently adapted to the culture of turnips, artificial grasses, the various species of grain, and of breeding and feeding the most improved kinds of stock, particularly sheep, it being perfectly sound, or safe from the rot.

3d. *Wet Loam*, generally on a clay bottom. The fertility of this soil is various, depending on the thickness of the staple, and the nature of the clay below: it is dangerous for sheep, but may be applied with advantage to keeping cows for the dairy, breeding young cattle and horses, and to the culture of wheat, oats, clover, and ray grass.

4th. *Black Peat earth*, is most prevalent on the mountainous districts, particularly those adjoining Northumberland and Durham: it is also found on moors or commons, in the lower parts of the county; in some places only a few inches thick, upon a white sand, well known, by those whose lot it has been to cultivate it, to be an ungrateful and unprofitable soil.

The surface is beautifully diversified with level plains, and rising eminences; deep sequestered vales, and stupendous mountains; open, braky, heathy commons, and irregular inclosures, in some parts enriched with tufted groves and rising plantations; the whole watered with innumerable streams and extensive lakes, abounding with fish of various denominations, which, with plenty of game, add to the recreation and luxury of the inhabitants.—It naturally divides into two districts; the *mountainous*, incapable of being improved by the plough; and the *cultivatable*, or all such parts as have been, or can be improved by tillage.

The mountainous districts are separated into two divisions, one of which bounds the east side of the county, and is the *highest part* of that ridge of mountains, that divide the eastern and western coasts of the island, from Derbyshire in England, to Linlithgow in Scotland. Cross-fell,

fell, Hartside-fell, Geltsdale-forest, and Spadeadam-waste, are the names of that portion of the ridge which passes through this county. These mountains are composed of strata of different kinds of stone, and are rich in coal, lime, and lead-ore; but are no way remarkable for any striking irregularities of surface.

The other division of mountainous district occupies the south-west part of the county, known by the names of Skiddaw, Saddle-back, Helvella, Wreynose, Hardknot, Sca-fell, &c. &c. remarkable for their steep, broken, rocky sides, and romantic shapes; and are in general one mass of that kind of stone, which produces the beautiful blue slate, so much and so deservedly esteemed for covering the roofs of houses. They are destitute of coal, lime, or metallic ores; but in some measure repay this defect, by affording such valuable slates; and producing that singular mineral substance, *blacklead*, which is found in Borrowdale, and, it is said, no where else in the southern part of the kingdom.

The height, ruggedness, steepness of the sides, (in some places ornamented with wood and projecting rocks) the varied forms, sublime assemblage, and picturesque beauty of these mountains, and the lakes they environ, form scenes that few other places, if any, in the island can equal; and have at different times exercised the pens of many descriptive writers:—it comes only within our province to remark, that this kind of slaty stone appears to be very friendly to vegetation: the soil which covers the steep sides of these mountains, and found in considerable depth at their bases, is in great part decayed slate; and the most fertile soils in the vales, we suspect, have a large portion of this slaty matter in their composition; this is the case in the vale of Keswick, and particularly at Mill-beck, and along the western base of Skiddaw.

From a map of Cumberland, published by Messrs Hodgkinson

kinson and Donald, laid down from a scale of two miles to an inch, we calculate, that

	<i>Acres.</i>
The mountainous districts contain, - -	342,000
Improvable common, - - - - -	150,000
Old inclosures, - - - - -	470,000
Lakes and waters, - - - - -	8,000
Total quantity of acres in the whole county,	970,000

SECT. 5.—*Minerals.*

This county abounds with coal, lime, and lead-ore; it also produces blacklead, copper, gypsum, lapis calimmaris, and excellent slate.

Coal,—as observed in the last section, is found in many parts of the eastern mountains; and, with not many exceptions, all along that tract (extending in different degrees of breadth,) from Sebergham to Whitehaven, and along the coast to Maryport, forming a district of about 100 square miles.—Cannel coal is got in large quantities in the parishes of Caldbeck and Bolton.

Limestone—abounds in most parts of the eastern mountains, and in the parishes of Graystock, Dacre, Penrith, Broadfield Common, &c. and in the neighbourhood of Egremont and Whitehaven.

Gypsum—is got in the parishes of Wetheral, and St. Cuthbert's, Carlisle; but has never been applied there as manure.

Lead-Ore—is got in great abundance in Alston Moor; and, in a lesser degree, in the parishes of Caldbeck, and Melmerby.—In the lead mines is also found the lapis calimmaris.

Copper-Ore—is found also at Caldbeck, Melmerby, and

at Hesket, but at present not worked with that success which formerly attended them.

Black-Lead,—is found only in Borrowdale, a few miles west of Keswick.

Blue Slates—of an excellent quality, are gotten in Borrowdale, and inferior sorts in some of the neighbouring mountains.

Freestones—abound in most parts of the county; some of which split into good slate: but are more heavy, less durable, and require stronger timber to support them, than the blue slate, and are also more subject to imbibe moisture.

SECT. 6.—*Waters.*

Tho' this county enjoys an extent of 67 miles of sea-coast, yet it cannot boast of its navigable rivers; the tide flowing not more than two or three miles up the greatest part of them; even the Eden, by much the largest, is perplexed with shoals, and its navigation cannot be said to reach beyond Sandsfield, though the tide flows a few miles further.

There are few places where water is so abundant and good, as this district is blessed with; for besides the large rivers Eden, Derwent, Esk, &c.—every village, and almost every farm, enjoys the benefit of a pure spring, or is visited by a rivulet. The larger rivers abound with Salmon, Trout, and various other kinds of fish, and the smaller brooks with Trouts and Eels. It is also ornamented with many beautiful and extensive lakes; which, with their pleasing accompaniments, have of late years made the tour of the lakes a fashionable amusement, and from whence considerable emoluments have resulted to the neighbouring inhabitants.

CHAPTER II.

STATE OF PROPERTY.

SECT. 1. — *Estates.*

THERE are probably few counties, where *property in land* is divided into such small parcels as in Cumberland, and those small properties so universally occupied by the owners; the annual value of these tenements, varies from 5l. to 50l. a year: but the generality are from 15l. to 30l. some few extend to 100l. or a little more.

The rental of the largest estate in the county, is said to amount to about 13,000l. per annum.

SECT. 2. — *Tenures.*

By far the greatest part of this county is held under lords of manors, by that species of vassalage, called *customary tenure*; subject to the payment of fines and heriots, on alienation, death of the lord, or death of tenant, and the payment of certain annual rents, and performance of various services, called *Boon-days*; such as getting and leading the lord's peats, ploughing and harrowing his land, reaping his corn, haymaking, carrying letters, &c. &c. whenever summoned by the lord.

We cannot pretend to be accurate, but believe, that two-thirds of the county are held by this kind of tenure, principally in those small tenements described in the last chapter. — The remaining part is mostly freehold, which has increased with the inclosure of commons, and sometimes whole parishes, or manors, have been enfranchised on these occasions. Copyhold and leasehold, are rarely met with.

CHAPTER III

BUILDINGS.

SECT. 1.—*Houses of Proprietors.*

DESCRIPTIONS of Gentlemen's seats, we presume, come more under the notice of a topographical survey, than an agricultural one; we therefore must refer to different tourists, and more particularly to Hutchinson's *History of Cumberland*, now publishing.

SECT. 2.—*Farm Houses, &c.*

Through the greatest part of this county, the *farm-houses* are remarkably well built of stone; * the blue slate roofs, and white dashed walls, give them a look of neatness, that is peculiarly pleasing, and preposits a stranger with a favourable idea of the cleanliness of the inhabitants; an idea which he finds well-founded, on further investigation.

These houses have, for the most part, a kitchen and a parlour in front, a toofall, back-kitchen, and milk-house behind, with four or five lodging-rooms above; the front contains five middle-sized sash-windows, two below stairs, and three above.

Where farms are so very small, no great extent of farm-

* Except a small district in the neighbourhood of Abbey-holm, and the north-east extremity of the county, particularly in the parishes of Bewcastle, Stapleton, Kirklington, Kirkandrews, and Arthuret, where they are mostly built of mud or clay, and form a miserable contrast to the buildings in the other part of the county.

offices are wanted; a barn, a byer for housing their cattle in winter, and a small stable, are in general all that is necessary: no regular plan for the form or site, seems to have been adopted, every one building according to what he thinks the most convenient for his stock and situation; but they are mostly built at each end of the farm-house. Fold-yards, surrounded by proper offices, *with a shed for cattle*, are very rare in many parts of the county; we believe they are most prevalent in the parish of Heskett, and its vicinity; the best and largest we noticed was at Lord Muncaster's.

We observed, in some parts of the county, a singular practice of covering the perpendicular walls of their houses with blue-slate, to prevent (we suppose) any kind of moisture from penetrating them.

Repairs are generally made at the joint expence of landlord or tenant; the former supporting walls, doors, and timber; and the latter thatch, slate, glass, &c.

SECT. 3.—*Cottages.*

Of this description of buildings, there are not many purposely erected for labourers in agriculture, very few of that class being wanted in this county: as the farms are so small, the occupiers and their families are generally sufficient for the work without any foreign aid.

CHAPTER

CHAPTER IV.

MODE OF OCCUPATION.

SECT. 1.—*Size of Farms.*

ON the large estates, there are some farms from 100l. to 150l. a year, few reach 200l. and we only heard of four or five, that got as high as 3 or 400l. a year, and one of 600l.; but the most general size of farms in this county, is from 15l. to 50l. a year.

Cumberland farmers may be divided into three classes: the occupiers of large farms; the small proprietors, (provincially "*Lairds or Statesmen*;") and the small farmers.

It is to the first class, and the gentlemen farmers, that this district owes the introduction of any of the modern improvements in agriculture; and we were glad to find a spirit of enterprize arising amongst them, for the adoption of new modes of culture, and improved breeds of stock.

To the small Proprietors,—agriculture, we presume, is little indebted for its advancement: these "*statesmen*" seem to inherit with the estates of their ancestors, their notions of cultivating them, and are almost as much attached to the one as the other: they are rarely aspiring, and seem content with their situation, nor is luxury in any shape an object of their desires; their little estates, which they cultivate with their own hands, produce almost every necessary article of food; and cloathing, they in part manufacture themselves; they have a high character for sincerity and honesty, and probably few people enjoy more ease and humble happiness.

The small Farmer—is obliged to raise such crops as will pay him best for the present, and avoid every expence, of which he does not receive the immediate advantage, by which means, his farm, and himself, are always kept in a state of poverty: many of these small farmers are also mechanics, and agricultural labourers, that farm from 5l. to 10 or 12l. a year.

SECT. 2.—*Rent.*

In the vicinity of towns, land lets from 2l. to 4l. an acre; farms at a distance from towns, from 5 to 30s. per acre; in general the average may be stated at about 15s. per acre; rent is almost universally paid in money.

SECT. 3.—*Tithes.*

Tithes are mostly taken in kind; a few parishes pay a modus in lieu of tithes, and others are tithe-free, in consequence of a portion of common being given to the proprietor.

SECT. 4.—*Poor Rates.*

At Carlisle, 2s. 0d.—Wigton, 2s. 6d.—Aldfron, 3s. 0d.—Harrington, 1s. 6d.—Kirkoswald, 1s. 8d.—And in many of the country parishes, they vary from 6d. to 10d. per pound.

SECT. 5.—*Leases.*

The noblemen and gentlemen who enjoy the most considerable landed property in this county, let no leases; some have verbal contracts for seven years, which are next to none; and of those who let leases, the term is only for five, seven or nine years; besides the usual reservations of mines, wood, &c. the tenant covenants to pay the

the rent, cesses, taxes, and to keep all in repair; some are confined to a certain quantity of tillage, and to fallow one-fourth yearly; others are under no restraint of this kind; a few others are confined to lay on a certain quantity of lime, and to sow with white clover and hay-seeds, the lands that are laid to grass: these are the principal covenants that affect agriculture. To enumerate such as are of a local nature, respecting the performance of customs, services, grinding corn, payment of chickens, &c. would add little to the improvement of agriculture, or enlargement of rural Science.

SECT. 6.—*Expense and Profit.*

For the mode of investigating this subject, we must refer to the Northumberland Report, page 33.

CHAPTER V.

IMPLEMENTS.

THE *Plough* of this county is the swing plough, used through all the northern counties, in which we observed no improvement.

To spend time in describing the harrow, roller, &c. that have been used in almost every part of the kingdom for some centuries, would be augmenting this Report to little purpose.

The Carts, through the whole of this county, are drawn by a single horse, and probably originated through necessity, from the small farmer keeping no more than one

horse. In those times, simplicity and cheapness were only considered: we recollect seeing some of those "*tumble carrs*," without one piece of iron about them; the wheels were made of three pieces of wood, joined by pins of the same material. It is probable they had the name of *tumble carrs*, from the axle being made fast in the wheels, and the whole turning, or tumbling round together: but this construction has given way to the wheel with a nave and spokes, turning round a fixed axle, which is much more manageable, in quick or short turns.*

The advantages of single horse carts are so well understood in this county, that we did not see any other used.

Three single horse carts are driven, without any difficulty, by a man, or a boy, or even women and girls; along the coast, more than half the carts are driven by females, and many of these under twenty years of age, with as fine forms and complexions, as ever nature bestowed on the softer sex. We cannot help saying, we were disgusted at seeing them put to this employment; and especially, at their riding in so awkward a manner behind the cart-saddle.

Double mould-board Ploughs—are used by some farmers, to form the one-bout ridges for turnips and potatoes, and also for earthing them up.

Winnowing Machines—have been lately introduced, and are now become very general; twenty years since, corn was winnowed without any sort of machine; and the farmer was under the necessity of waiting for a natural wind, sufficiently strong to blow the chaff from the grain; and very often had to take it to some eminence at a distance, where the breeze was more certain.

Threshing Machines, Drills for sowing the various kinds

* The price of a tumble carr is 5*l.*—the price of the other kind, 7*l.* ready for yoking.

of grain, and horse hoes, have not yet found their way into this district.

CHAPTER VI.

INCLOSURES.

THE mountainous districts are all open, and most probably will long remain so: the cultivatable parts are a mixture of old inclosures and commons, interspersed through every part of the county.

The size of inclosures, in general, is in proportion to the size of farms: the ancient fields are small and irregular; the fences of various constructions; walls, earth mounds, thorns, hazle, and other brush-wood, all lend their aid in a greater or less degree; and, in two or three places, we observed large tracts totally inclosed by whin-fences,* which have a very ragged, slovenly, and uncouth appearance, from the numberless gaps where the whins have been destroyed by frost, an accident to which this plant is very liable; nothing but the greatest necessity can justify the use of whin-fences.

The fields of those commons that have been divided within the last thirty years, are laid out in straight lines, and mostly inclosed by quick fences, which in general have done very well.

The advantages that arise from inclosing, in respect to increase of produce or value, must entirely depend upon the modes of management, pursued after the inclosing takes place. From the abundant crops produced by land, which has never grown grain before, the occupier vainly

**Ulex Europæus*.—Furze.—Gorse.—Whins.

thinks, that it will always continue to do so; and the deception is still increased, by the stimulating effects of lime; but alas! after having got nine or ten crops, the golden prospect vanishes! the farther they proceed, the more they are convinced of their error; and growing corn having become a losing trade, the land is left to grass; but what can it produce? already exhausted by repeated corn crops, and over dozes of lime, it remains a spectacle of the bad effects of such culture, and a warning to others to avoid the same course: even under this treatment, the increased value is in the ratio of three or four to one; had these lands been continued in tillage only three years at one time; the first year oats; second, fallow, turnips, or rape; the third, wheat or oats, or (if the soil suited) barley, sown up with clover and ray-grass, and depastured with sheep for three, four, or five years, according to circumstances and situations, we will venture to say, the land would have gone on improving, from rotation to rotation; would have been more profitable, and put on a very different aspect to what it does at present, and have been worth double the rent it now lets for.

The advantages arising from inclosing of commons, in respect to the improvement of stock, is obvious; while in a state of common, every one turns on what he pleases; and there is generally double the quantity of stock that there ought to be. The consequence is, they make no improvement; they barely exist; the yearly profits how small! Should an enlightened breeder wish to improve his sheep, how is he to effect it, while his ewes mix promiscuously with his neighbour's flocks? If he had the best tup in the kingdom, can he be sure that one of his ewes would be tupped by him, while there are probably not less than a score of his neighbour's to contest the female with him? On the other hand, if the common were inclosed, every one would stint with that species of stock

for

for which his allotment was best adapted, and in such numbers as would insure profit: when he can confine his ewes within his own inclosure, he can make whatever experiment he pleases; by putting a few, or many ewes, to any particular tup, without any fear or apprehension of having a spurious breed, by the interference of his neighbour's: he is also enabled to keep his flock from many disorders: few commons but have some tracts of land liable to the rot: how are they to be prevented from depasturing upon it? or if the scab, or other infectious disorders, have taken place amongst any flock on the common, how is he to avoid it?

To the question put by the Board, "has inclosing commons decreased population?"—We answer, that we cannot conceive, how inclosing of commons can decrease population: unless an increase of corn and cattle, an increased demand for labourers and mechanics of various denominations, tend to decrease mankind; the contrary position must certainly hold good in an eminent degree.

The best account we could obtain of commons, divided by act of parliament, were,

Sowerby,	about 25 years since.
Sedbergham,	about 30 years since.
Stainton	- 20
Culgaith,	- 22
Carlton,	- 15
Skelton,	- 25
Brampton,	- } 14
Irthington	- }
Newby,	- }
Farlam,	- 12

At the last four places, the lord of the manor had 1-12th for his consent as lord of the soil, and making the allotments freehold: at most of the others the lord had 1-8th.

CHAPTER VII.

ARABLE LAND.

SECT. 1.—*Tillage.*

TILLAGE-LAND is here commonly ploughed by horses; a team of oxen, we believe, is not to be found in the county: the horses are yoked double, and driven with cords by the ploughman. An acre is accounted a good day's work; and on light soils, an acre and a half.

The ridges are very narrow, from 5 to 7 feet, being the common breadth, whether in corn or in grass.

Fallows for wheat or turnips,—are ploughed once in the Autumn, by the best cultivators, and four or five times in the course of the succeeding Summer.

Barley—is sown on one ploughing after turnips: but after a white crop, (as in rotation first) they plough twice, and manure with 20 or 30 cart-loads of dung: some add lime.

Oats—are always sown on one ploughing.

SECT. 2.—*Fallowing.*

Fallowing for wheat and turnips, is practised in many parts of this county; four or five ploughings and harrowings, is the general practice: we saw some very clean, and well managed, gathered up into neat narrow ridges, on which the wheat was looking very healthy.

SECT. 3.—*Rotation of Crops.*

The most prevalent system, through a great part of this county, is, to have a crop of white corn every year while

while in ploughing: such cultivators make no fallows, except ploughing twice, and manuring for barley, can be deemed such.

Where a field is ploughed out from grass, they have oats.—oats,—barley,—oats; or, oats,—barley,—oats,—oats, &c. &c. for nine or twelve years, and then left to grass for seven or nine years. Some few sow hay-seeds and a little white clover; but the greatest part leave it to nature.*

Where they fallow for wheat, the rotation is,

- 1 Fallow
- 2 Wheat
- 3 Oats, or Barley
- 4 Oats,—for 3 or 4 rotations, and then left for grass, for seven or nine years; some few sow clover and hay seeds.

In those places where the turnip culture is practised, the rotation is,

- 1 Turnips
- 2 Barley
- 3 Clover
- 4 Ditto
- 5 Oats.
- 6 Ditto.

Or,

- 1 Turnips
- 2 Wheat

* On asking a farmer at Uldale why they sowed no clover, or grass seeds, he replied, "*we have no occasion, for the land is naturally grass-proud.*" Those that are experienced in cultivation, will readily admit, that after growing from six to twelve white crops in succession, it can scarcely be otherwise than *grass-proud*. There is certainly grass in abundance; but of such kind, as no good farmer would wish to be possessed of. This barbarous system is practised upon many dry loamy soils; which, after being thus left to grass, cover amazingly fast with moss, probably owing to the bad cultivation and exhausting crops of corn more than to the wetness of the climate, to which it is generally attributed.

3 Barley

3. Barley
4. Clover
5. Ditto
6. Oats.

We are glad to find, that two or three individuals have adopted the idea of not taking two white crops in succession, and pursue the excellent rotation of turnips,—barley,—clover two years,—then oats, or wheat.

SECT. 4.—*Crops commonly cultivated.*

Wheat is a modern production here; a general opinion used to prevail, that wheat could not be grown in many parts of this county. We were informed that it is not much more than 40 years, since Summer fallows for wheat were first used; and it is not twenty years since Lord Muncafter introduced Summer fallows, and the culture of wheat, in the neighbourhood of Ravensliff, where it is now grown in great abundance, as well as all along the coast to Scotland, and in the neighbourhood of Carlisle. The wheat that is sown after turnips or clover, is trifling, the main supply is from Summer fallows; they generally sow two bushels and a half per acre, in September or October, as the season suits, and they reap from sixteen to thirty bushels per acre.

Barley and *Oats*, being the grains from which the bread of the inhabitants is made, were probably the first, and only corn, grown in this county for many centuries; *bigg* or *beor*, with four rows of grains on the ear, was the kind of barley formerly cultivated; but lately, the common early sort, with two rows, has been introduced. They sow two and a half bushels per acre, in April or May, and reap twenty-one bushels on an average.

The Common Oat, was the only variety grown in this county, and is now by far the most prevalent; but of late years,

years, a few enterprising individuals have introduced the early varieties of this grain, with great advantage; they are distinguished from the common oat by the name of *layland oat*, and are the Dutch or Friesland oat.*

The quantity sown,—is from four to six bushels per acre.

The time of sowing,—March or April.

The Produce—from 15 to 40 bushels per acre; but the average of the county was stated to us, to be only 20 bushels per acre.

Pease.—In a climate where so much rain falls, and where the harvest is so precarious, the culture of pease would be attended with so many chances of loss, and so few of gain, that we were not surprised to find them so generally neglected. The difficulty of harvesting them, has probably first suggested the idea, of building their stacks in the *cloughs*† of trees, and afterwards in slender high pyramids round the boles of tall trees, to prevent them from blowing over: by this method, they can also lead and stack them, in a damper or moister state; and as they do not come near the ground by five or six feet, they are seldom troubled with mice. The greatest diameter of the stacks is not more than six or seven feet; the height of many twelve or fifteen; if the tree has not a sufficiency of convenient branches to bear the bottom, they nail a stick or two across, to form a base. When finished, they have a very singular appearance.

Turnips, were first cultivated in this county, to any effect, for the use of cattle, by Philip Howard, Esq; of Cor-

* Last year Mr. Falder, near Roes Castle, introduced the oat, known on the east borders by the name of *Church's Oat*, (a variety, and perhaps the best variety known, of the Poland oat) and which will, no doubt, answer well on all the best rich soils in the county.

† Where the main stem divides into branches.

by, in the year 1755: his first essay was drilled at four feet distance; the crop amazingly good; the weight on an average, 10 lb. each turnip; some weighed 25 lb; he afterwards continued to grow them at two feet, and two and a half feet distance, with constant success, for eight or ten years, before any farmer followed the example; at last, Mr Collins, of Wetherall, made a trial, and succeeded; others soon followed him.

It is, therefore, about thirty years since a few farmers first began to cultivate turnips; and considering with what tardiness new modes of practice generally make their way amongst that useful class of society, it is no wonder that the growing of turnips should, in a great measure, be still confined to the vicinity where their cultivation originated; and we suppose, by the mode of practice, that from this source may be traced the various patches of turnips we observed at Netherby, Burgh, Dalton, and a few other places.

The land, after being made sufficiently fine by repeated ploughings and harrowings, is set up in one-bout ridges* at 30 inches distance; the dung is put in the bottom of the hollow intervals, and covered with earth by the plough; the top of the one-bout ridge is flattened by tralling a piece of wood over it, and on the flattened top the turnip seed is sown by a drill, which a man pushes before him like a wheel-barrow.

The drilled turnips are hoed, and set out at about eight or nine inches distance in the rows, which are ploughed between by a small plough.

Hoeing broad-cast turnips is not understood; if any are sown this way, they go unhoed; and if too thick, are

* Provincially "flitches."

hand-

hand-weeded. Mess. Williamson and Monkhouse paid 20s. per acre this year, (1793) for hand-weeding their broad-cast turnips.

The value of this excellent vegetable is not sufficiently understood in this county, otherwise it must have made a more rapid progress. Probably this may be owing to its being applied to feeding their *own breed of sheep*. We saw several acres of turnips this year, that were sold for, from 3l. to 3l. 10s. per acre, which a Northumberland grazier would have thought worth five or six pounds an acre, for feeding the *improved* breed of long-woolled sheep.

Potatoes are cultivated in one-bout ridges, by almost every farmer, not only for the use of their own families, but for sale, where the situation is not too distant from a good market. It is only upon the estate of Sir James Graham, at Netherby, that they are applied to feeding cattle and swine: and by Lord Muncaster, to feeding cattle, who also gives them to his horses; Mr Lamb and Mr Blalock favoured us with the following particulars:

Mr Blalock feeds cows, and says, that 120 bushels of potatoes, with 16 stones of oatmeal, will fatten a cow in three months, equally well as turnips, of 3 or 4l. value.

The small farmers apply potatoes to feeding swine: thirty bushels of potatoes and ten of corn, made into meal, will fatten a swine of eighteen or twenty stones weight, equal to corn of 1l. 15s. value. The potatoes are *boiled*, and meal mixed with them.

From these data, the value of potatoes may be nearly estimated:

The expence of feeding a cow with potatoes and	£. s. d.
meal is - - - - -	3 12 0
from which deduct the value of 16 stones of	
oatmeal - - - - -	1 12 0
leaves for 120 bushels of potatoes - - - - -	2 0 0

	£.	s.	d.
The expence of feeding a swine with potatoes			
and meal is - - - - -	1	15	0
deduct the value of corn 10 bushels, fire, attend-			
ance, &c. - - - - -	1	5	0
leaves for 30 bushels of potatoes - - -	0	10	0

From the above it appears, that potatoes for feeding cows, or swine, are worth no more than 4d. per bushel. They estimate a fair average crop of potatoes to be 240 bushels per acre; the value at 4d. per bushel, is only 4l. out of which the seed ought to be deducted, the other expences attending the cultivation of potatoes and turnips being much upon a par.

The land on which these potatoes are grown, is a most excellent turnip soil, and would produce turnips, almost any year, worth 5l. per acre for feeding cattle or sheep.* From the above statement it appears, that an acre of potatoes is of less value, than an acre of turnips for feeding cattle. Mr Lamb has been long convinced of this, and says, that the practice of applying potatoes to feeding cattle and swine, is every year losing ground, and the culture of turnips, which was pretty general here twenty years since, (but gave way to potatoes) is now, in its turn, regaining the situation it so justly deserves.

SECT. 5.—Crops not commonly cultivated.

Beans—we were informed are seldom cultivated with success; the failure may probably be owing to their being sown broad cast, without manure, and not hoed: we would recommend, to some spirited cultivator, to try them in drills at 30 inches intervals, so as to admit of be-

* Mr D— asks, “how can turnips be worth 5l. per acre, for feeding cattle and sheep?”—We reply, nothing is more common; they are frequently sold for much more.

ing

ing horse-hoed, and ploughed between; this mode we can recommend, on the successful practice of several years.*

Cabbages—have been cultivated by Lord Muncaster, Dr Harrison of Penrith, and a few others in that vicinity.

Carrots—have also been tried by Lord Muncaster, who found them a very troublesome and expensive crop, owing to the abundance of weeds, occasioned by the great rains and moisture of the climate.

Flax—is cultivated in small quantities, on the northern extremities of the county, for family use; but much less now than formerly.

CHAPTER VIII.

GRASS.

SECT. I.—*Natural Meadows and Pastures.*

NNATURAL meadows are generally found in narrow strips by the sides of rivers. “The largest tract of natural meadow, in this county, is in the parish of Scaleby, which lets for 28s. per acre: also between the lakes of Keswick and Bassenthwaite, there is a considerable extent of natural meadow.

Natural pastures are not very numerous in the cultivateable districts of the county; unless such may be called natural pasture, which is left to nature to cover with herbage after having been exhausted with growing corn. If by natural pastures be understood such as have

* See Northumberland Report.

never been disturbed by the plough, there will be found great abundance in this county; as not only all the commons in the cultivateable districts, but the mountains may come under that denomination.

SECT. 2.—*Artificial Grasses.*

Artificial Grasses, are here confined to a small number—red clover, (*trifolium pratense*) white clover (*trifolium repens*) common hay-feeds, with a little rib grass (*plantago lanceolata*) and ray-grass, (*lolium perenne*.)

We were informed, that in 1752, no person in the county had thought of sowing a field down with clover, or even hay-feeds; and that Philip Howard, Esq. of Corby, was the first who sowed a field with clover, and taught his countrymen the use of artificial grasses; yet it is but a few that have benefited by his laudable exertions.

Red Clover, is principally sown where the turnip culture, and summer-fallowing for wheat, are practised, and the land continues only two years in grass: it is generally mown the first year, and depastured the second. The great objection to growing this valuable grass, is the *hoving* of cattle, which may be obviated by depasturing it with sheep, or by a little caution in having the cattle pretty full, before they are turned into it, and to take care to put them to it on a dry day. Some object to it, because they have taken a fancy that it impoverishes the soil. Old Ellis says, "*Clover is the mother of corn.*" We believe that, could the Cumberland farmers be induced to make an experiment, they would be of the same opinion, and would find their profits so superior to what they are at present, that they would become converts to the cause. We hope we do not exaggerate when we say, that the profits of red clover for two years, would be double to that derived from the same quantity of ground sown with
white

white clover, rib grass, and hay-seeds; and that the profits of the succeeding crop of corn would be nearly in the same ratio.

White Clover, has many advocates, and is certainly a valuable plant, where land is intended to continue in grass for a few years, which is generally the case here; and by those who sow any kind of grass seeds, it is in great repute; it is seldom or never sown alone, but accompanied by what is here called *common hay-seeds*, which are generally harmless, from the heat they mostly get in the stacks, and their vegetative powers thereby destroyed: where that is not the case, we fear more weeds than useful plants would be the produce; for when it is considered, that of the useful plants which compose a good meadow, scarce two of them flower and ripen at the same period; and as the time of mowing is governed more by the weather, or other circumstances, than the collection of useful seeds, it may happen, that not one valuable plant may then have its seeds in that state of perfection, which is necessary for the reproduction of its species; at the same time it is probable, that you may obtain the seeds of many plants, which you would wish to avoid.

Rib Grass, is sown in some places where land is intended to continue in grass.

Ray-grass, has here but few advocates; a general prejudice against this plant seems to have taken place, we think *unjustly*, for we are convinced, from long experience, that under proper management, it is a valuable grass; it grows in all soils, and in all situations; early in the Spring, and late in Autumn; and even thro' Winter, on dry soils and in open weather: the only reasonable objection we know of, is the great propensity it hath to run to seed; but this may be easily obviated, by eating it bare with cattle, or by mowing the pasture just before

it begins to flower, which increases the eatage, by the quantity of bottom grass it sends forth after the operation.

It is the properest grass we know, to sow along with red or white clover; and we would beg leave to recommend it, instead of *common hay-seeds*, so universally sown in this county, with clover, both red and white.

SECT. 3.—*Hay Harvest.*

The hay harvest is here in the months of July and August; the modes of management various, according to the nature of the grass, weather, and notions of the farmer: we do not find any thing peculiarly excellent in their practice; the only singularity is, that the occupiers of small farms, in some parts of the county, put the whole of their hay into barns; the larger farmers stack their's at the door.

SECT. 4.—*Feeding.*

The most general system of grazing is,—on the richest grounds, *cattle with a few sheep*; on the less luxuriant, *sheep only*.

The kinds of cattle usually fattened are the native country breed, and Scotch cattle, both Kyloes and the Galloway kind. Of these, they find the Kyloes the quickest feeders, the Galloway next, and their own country breed of long horns the slowest.

The profits of grazing cattle depend much on the skill of the buyer, in *selecting the quickest feeders*; and, when fat, in selling them for their *full value*; also, not unfrequently, on the state of markets.

The best grazing lands we saw were at Pap Castle, near Cockermouth, let at 3l. per acre; and the holm lands on both sides the Eden, near Carlisle, let at 2l. 10s. per acre, for the purposes of *grazing only*, Mr Teulson, of the former

former place, buys in oxen and heifers in October, keeps them all Winter upon the pastures out of which his fat stock has been recently sold, and gives them a little hay in bad weather. After keeping them near twelve months, they leave, on an average, a profit of 5l each; their weight, from fifty to sixty stone. But this intelligent gentleman was candid enough to confess, that he thought sheep, mixed amongst cattle, a more profitable system; and we were glad to find this mode practised by all the best graziers in the county.

Of Sheep-grazing, there are two branches; first, feeding wethers; and, secondly, ewes for fat lambs: they are both bought in the Autumn, are kept on grass the whole time, and get no other food, except hay in stormy weather.

	£.	s.	d.
The profits are, a wether sold fat in October,	1	0	0
Fleece 3½ lb. at 5d. - - - -	0	1	6
	1	1	6
Deducting prime cost and expence of salving,	0	12	6
Average profit by feeding wethers, - -	0	9	0

	£.	s.	d.
Ewes, a fat lamb sold in June, - -	0	8	9
Fleece 3½ lb. at 5d. - - - -	0	1	6
Ewe fat, sold in November, - -	0	10	6
	1	0	0
Deduct prime cost and salving, - -	0	8	0
Profit by feeding ewe and lamb, - -	0	12	0

There are a few who buy in wethers, to feed upon turnips,

nips, and sell them in the Spring, to Manchester and Liverpool.

The kinds of sheep grazed are, *the country breed, the true black-faced heath sheep, and the Cheviot sheep.* The most experienced graziers all agreed, that the true black-faced heath sheep were *quicker feeders, and a hardier race,* than the Cheviot.*

CHAPTER IX.

GARDENS AND ORCHARDS.

GARDENS and Orchards in this county, are considered only as conveniences to private families; and not as objects of emolument, or commerce, as in some other districts.

CHAPTER X.

WOODS AND PLANTATIONS.

THIS county is far from being well wooded. The Irthing, Eden, and Caldew, are the only rivers,

* We wish to be understood, as not stating this as an *ascertained fact*, but as an *opinion* of the Cumberland graziers and farmers.

whose

whose banks produce any quantity of *natural wood*; and of these, the banks of the Caldew seem to have the largest proportion of old oak-timber. Of the value of the oak-timber proper for the purposes of ship-building, we could obtain no satisfactory information, but suspect, from what we saw, it is of small extent: we fear, the oak is not suffered to attain a sufficient age for this purpose; as we saw a wood near West-Ward (now felling) of upwards of two hundred acres, that was little more than thirty years old, the whole cut away, without leaving any to stand for ship timber.

Of late years, many plantations have been made near gentlemen's seats, which shew, by their vigorous growth, how well adapted the greatest part of this county is for the production of wood. From the nakedness of the country along the coast, one would naturally conclude, that the situation was inimical to that production; but Lord Muncaſter's extensive and thriving plantations near Ravenglaſh ſhew, that the nakedness of the land is owing to other cauſes.*

CHAPTER XI.

WASTES.



THE *extent of waste lands*, in this county, is very great:—Of mountainous pasture, 342,000 acres, which we sup-

* If a customary tenant plants wood, he cannot cut it without leave of the lord; in some cases, the lord claims it as his own, which sufficiently explains why the occupiers do not plant wood.

pose not capable of improvement from the plough; yet many parts of these districts might be applied to planting, with considerable advantage, and would probably in this way, make a better return, than if the soil had been in such a situation as to admit of being converted into tillage. We were glad to see a large plantation of larches thriving exceedingly well, on the steep edge of the west side of Skiddaw, lately planted by Mr Story. We hope the example will be speedily and extensively followed, by every proprietor of similar situations; but, unfortunately, the greatest part of these districts is in a state of common, and no improvement of this kind can take place while they continue in that situation: of course, the first step to improvement is a division, and for every proprietor to know his own part. If this cannot be done, the only means of improvement then left is, to convert them from unlimited commons to stinted pastures.

The present value per acre, of these mountainous districts, may be nearly estimated from the following data:

Mr Greenhow, of Threlkeld, takes pasturage for his sheep on Skiddaw forest for a year, at 5s. per score, which is three-pence per sheep; and supposing an acre keeps a sheep, then will three-pence an acre be the yearly value of these mountains. They can scarce be in a less productive state; an acre of wood, if it only grew broom-sticks, would pay much better.

Of the Commons, in the less elevated parts of the county, there are many, with large tracts of excellent soil, capable of being improved by judicious culture, proper draining, and improved breeds of sheep, to many times their present value; which is certainly very small, probably not more than from one to two shillings per acre. In a county like this, that does not raise corn sufficient for the consumption of its inhabitants, and where it is always one-fourth or one-fifth dearer than in an adjoining county, it

is lamentable to see such extensive tracts of *good corn land* lying waste, of no value to its owners, and of no benefit to the community. Instead of the present scarcity of grain, large quantities might be yearly exported; and instead of the ill formed, poor, starved, meagre animals that depasture the commons at present, an abundant supply of good fat mutton would be had to *grace* the markets of the county, and also to send off large supplies to Newcastle, Liverpool, Manchester, and other populous manufacturing places.

It is difficult to say, what would be the increased value of such land, under proper management; we think we cannot be wrong in stating, that it would be at least from six to eight times the value to the proprietors.—But of what advantage would it be to the public?

Acres.

We have already estimated that there are of improvable commons in the lower part of the county, } 150,000

Out of this deduct for bankfides, proper for planting, and other unfertile places, } 30,000

There will be left for cultivation, - 120,000

Suppose this be put into a rotation of three years tillage, and three years grass, then there will be in tillage yearly, } 60,000

Suppose one-third for fallow, and of this, one half to be turnips, the other half naked fallow for wheat, then will there be yearly,

	<i>Acres.</i>	<i>bush. per ac.</i>	<i>bush. per an.</i>	<i>Price.</i>	<i>val. per acre.</i>
Oats,	20000	at 30 is	600000	at 2s. pr bush. is	60,000l.
Wheat,	10000	at 20 is	200000	at 3s. pr ditto—	30,000
Barley,	10000	at 30 is	300000	at 3s. pr ditto—	45,000
Turnips,	10000			at 3l. pr acre.—	30,000
Naked Fallow,	10000				
Carried over	60000		1100000		£.135,000

And

Brought over £. 185,000

And suppose the grass land would only keep *one* sheep per acre more, then will there be an increase of 60,000 sheep yearly; the profit of which cannot be valued at less than 14s. each, the amount will be, } 42,200

Total value of increased produce - £. 227,000

CHAPTER XII.

IMPROVEMENTS.

SECT. I.—*Draining.*

DRAINING, is one of those improvements which has been introduced of late years into the northern counties; and where it is done with judgment, is, in many situations, of the greatest consequence.—Cumberland has not been behind its neighbours in adopting this beneficial measure: we were glad to observe, in many places, great advantages gained, both by hollow and surface drains; some done with great art, by one or more hollow drains running in the direction of the outburst of water, and cut deep enough to get through the bed of sand or gravel in which the water runs, and by that means arrest the source, which drowns the land below it; but the like intelligence has not in all places prevailed, for we often saw the drains running in parallel directions, *perpendicular to the source*, and at such distances, as the drainer thought the nature of the soil required; this is more particularly the case, where surface drains are used. The hollow drains are
filled

filled with stones when they can be got, otherwise with fods.

SECT. 2.—*Paring and Burning.*

This operation is seldom performed in this county, except on heathy, or coarse grounds: the expence about 15s. per acre.

SECT. 3.—*Manuring.*

Farm-yard dung, is here, as in most other places, the chief resource of the farmer: where turnips are grown, it is wholly applied to their culture; where they are not grown, it is used for the various purposes of dressing grass land, and for the barley and wheat crops.

Lime, is found in great abundance in many parts of this county, and of an excellent quality. The quantity laid upon an acre varies from sixty to an hundred and fifty bushels; we found it a general opinion, that lime did little good to land that had been long accustomed to it; and that those who had used the large quantity of 150 bushels per acre, found their lands greatly exhausted, and were now fully convinced of their error in continuing it so long, especially in such large quantities. We have had many opportunities of observing the abuse of lime, which, most probably, is one of the best manures known, for particular soils and situations, and under peculiar circumstances, and proper restrictions; yet, like many other good things, a superabundance may be prejudicial; or rather, we are sensible, that too often repeated, and in large quantities, it becomes hurtful.

Lime is mostly laid on, while the land is in a state of fallow; but in some places, we found it laid upon the grass land, *one or two* years before they intended to plough it out. We doubt the propriety of the latter mode.

Tangle,

Tangle, or Sea-Weed, is used along the coast, wherever it can be got; the quantity per acre is fifty or sixty cart-loads. This is known to be a valuable manure, either for corn, turnips, or grass, wherever it can be had.

Slake or Mud, left by the tide, is used in the neighbourhood of Ravenglass, with good effect, on the grass lands, fifty or sixty cart-loads per acre.

Muscles, are also used in the neighbourhood of Ravenglass, for manure, after the rate of five or six cart-loads per acre; they are got on the sands adjoining the coast.

Sea Sand.—An accidental experiment of Lord Muncaster's shewed its utility in destroying moss, but it is not used as a manure.

Compost.—It seems a general practice through every part of the county, to make a compost of lime and earth, in the proportion of one cart-load of lime, to four or five of earth; they use it as a top-dressing to their grass lands, and find it very beneficial.

SECT. 4.—Weeding.

All kinds of grain are sown broad-cast; the only weeding it gets is by hand: hoeing a crop of corn, we believe, was never once practised in the county. Turnips and potatoes are the only crops in which weeds are destroyed by hoeing.

SECT. 5.—Watering.

The only attempts we saw of this species of improvement, that had the least resemblance to a watered meadow laid out by art, was at Bleatarn (about six miles east of Carlisle,) belonging to Mr Richardson of Rickerby, to whom his country is highly indebted, for the spirited example he has set in many other improvements. We were
sorry

ferry to find, there was little more water than what was collected by rains; the ridges narrow and long; the trenches small, and inadequate to carry a sufficient quantity of water, for the purpose intended. It is unfortunate, that the first attempt should have been made in such a situation, and under such circumstances, in a county so pregnant with favourable situations, and the water of such an excellent quality, uncontaminated with mineral particles, or infusions that are suspected to be inimical to vegetation.

SECT. 6.—*Improving Heath Lands.*

The best mode of improving peat earth, being a desideratum of great consequence, the more facts that can be collected upon this head, the more light will be thrown on the subject, and the more likely we shall be to obtain the object sought for.

At Bleatarn, Mr Richardson has made great improvement; on a poor black moory soil, growing very short heath, in its original state, not worth sixpence per acre. He ploughs in Autumn, and lets it lie till the Autumn following; then ploughs across; and the next Summer makes a complete fallow, which he limes, after the rate of one hundred and fifty bushels per acre; and in April or May following sows it with grass-seeds (without corn) in the following proportion per acre: white clover, 8 lb.; red, 4 lb.; rib-grass, 4 lb.; ray-grass, $1\frac{1}{2}$ bushels; and common hay-seeds, 6 bushels.

Another mode is to plough up in the Winter, and leave it in that state thro' the Summer, to rot, until next Spring, when it is ploughed across, and made sufficiently fine by repeated harrowings, ploughings, and burning of the fods, to sow with turnips in June: to the above quantity of lime is added 30 single-horse cart loads of dung. On a part of the fallow this year, we saw some drilled turnips, worth

worth 3l. an acre: in addition to the lime, they had fifty single-horse cart-loads of dung per acre: but as dung is rarely to be procured for improvements of this kind, we think, that a crop of rape might be got for Spring seed, without dung, which would certainly be better than a naked fallow, as in the first mode. The lands that have been laid down two years, were full of grass,* and excellent pasture for sheep; but to make them thus productive, they are loaded with the following expences, which, according to Mr Richardson's estimate, including the various ploughings, harrowings, lime, dung, grass-seeds, interest of money, &c. amount to 11l. 11s. 6d. per acre: from which taking the value of the turnips 3l. leaves 8l. 11s. 6d. the expence per acre, on the grass.

Near Naward Castle, Mr Ramshay has made great exertions in reclaiming peat-moss, *by throwing it up with a spade*, into round ridges seven yards wide; the top being from twelve to eighteen inches higher than the furrow, which is cut deep enough to act as an open drain. In this state it lies all Winter: In the Spring following, he covers it nearly an inch thick, with a compost, formed of five loads of earth, to one of lime; and upon this dressing, sows,

Common hay-seeds, 12 bushels per acre.

Ray-grass, - - - 2 ditto.

Rib-grass, - - - 2 or 3 lb. ditto.

Where the land is dry enough, they plough; and, to the above quantity of grass-seeds, add a few pounds of white clover.

Mr Ramshay uses few hollow drains. Those that require to be three or four feet deep, he slopes off at the

* From many observations made on similar improvements, we have always found the first and second years grass by far the most valuable; after this they decline in value, and in a few years return to their original heath, if not prevented by ploughing.

sides, into which the furrow drains empty. We saw some lands that had been done two years; the ray-grass and rib-grass growing well; the woolly holcus (*holcus lanatus*) in abundance: it comes naturally on all such soils; but is a grass that few kinds of stock will eat, unless compelled by hunger.

Mr Ramshay informed us, the expences of making these improvements amounted to 10l. an acre; of course, both this and Mr Richardson's, to pay common interest for the money expended, ought to let at 10s. an acre for a term of 21 years.

CHAPTER XIII.

LIVE STOCK.

SECT. I.—Cattle.

THE Cattle, are a small breed of long horns, with a few exceptions of the Galloway breed intermixed, particularly along the coast from Whitehaven to Carlisle.

This breed of long-horns is not distinguished by any peculiar good qualities, which is not to be wondered at, when it is considered that, probably at this time, there is not one person in the county that pays any attention to its improvement. Twenty years ago Mr Hazle, of Dalemain, had made some progress in this business, and gained a very useful breed of long-horned cattle; but his successors neglected them, and the labours of the good old man are totally lost.

The long-horned, and the Galloway polled cattle, are probably the best adapted to this county of any other; but the kind of long-horns that occupy it at present, may certainly be much improved, by paying proper attention, to breed always from the best males and females that can be selected. This end would be the readiest attained, by getting good bulls and heifers from the midland counties, where the long-horned breed are brought to great perfection.

The Dairies are small, and mostly employed in making butter, of an excellent quality. Those that are situated in the vicinity of towns, sell it weekly, by the pound, to supply the consumption of the inhabitants. In other situations, it is put into firkins of 56 lb. each, and sent to distant markets.

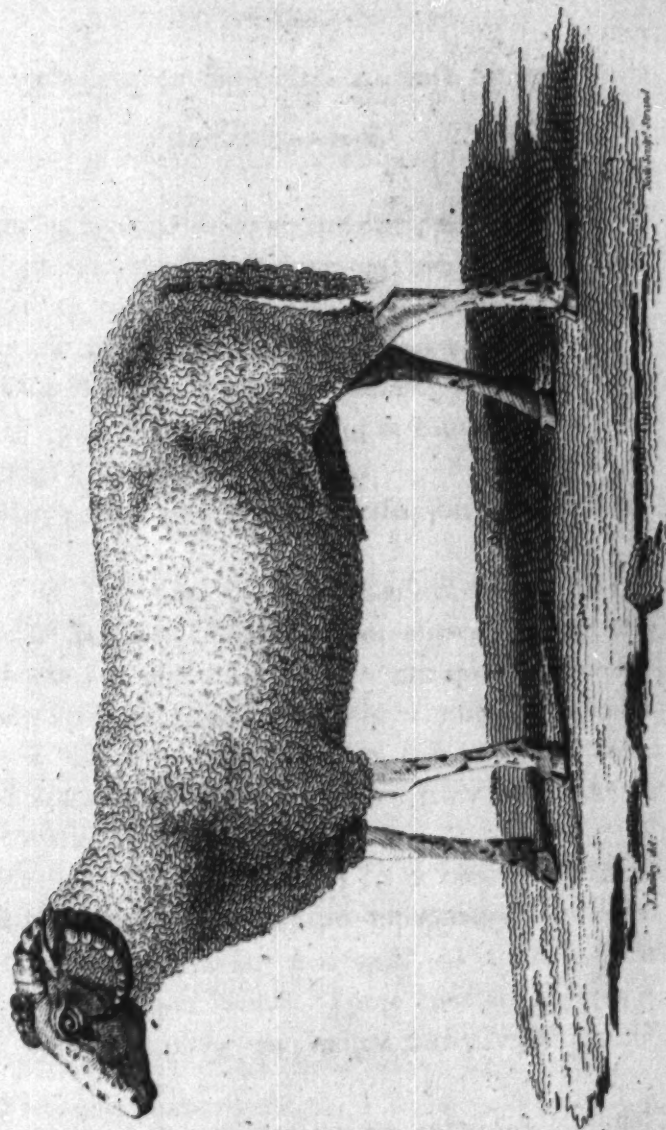
The average quantity of butter from one cow, is generally estimated from one to two firkins: some cows will give twelve quarts of milk at a meal, and make seven pounds of butter per week; but the most general average is, seven or eight quarts of milk at a meal, and from 3 to 5 pounds of butter per week, through the Summer.

Skimmed milk *cheese*, is the principal kind made here, and chiefly consumed at home.

On those farms that have a right of common, the grass lands are employed through the Summer in growing hay, depasturing their cows, and sometimes young cattle; but the latter are more generally summered on the commons, and in Autumn brought into the old inclosures, till the approach of Winter, when all the cattle are housed.

SECT. 2.—*Sheep.*

The sheep bred in this county are only of two kinds,
and



A HERDWICK RAM



and these two are probably something related; one of them is peculiar to that high, exposed, rocky, mountainous district, at the head of the Duddon and Esk rivers, more particularly known by the names of Hardknot, Scalefell, Wrynose, &c.

Of this breed of sheep, (commonly called *Herdwicks*,) the ewes and wethers are all polled or hornless, and also many of the tups; their faces and legs speckled; but a great portion of white, with a few black spots on those parts, are accounted marks of the purest breed, as are also the hornless tups; they have fine, small, clean legs. We were told that the lambs, when dropt, are well covered; the wool is short, and form as thick matted fleece, much finer than that of the black-faced heath sheep; with which variety they seem to have been crossed, as we suspect, from some of the rams having spiral horns, and from some *kemps* or *hairs* being intermixed amongst some fleeces of the wool: they are a lively little animal, well adapted to seek their food amongst these rocky mountains, in many places stony and bare; and where covered, the soil is thin, but the herbage mostly green, though heath is found on their summits. They have no hay in Winter, and support themselves in the deepest snows, by scratching down to the heath, or other herbage; indeed it seldom happens, but that some parts of the mountains are blown bare, which the sheep find out. They do not face the coming storm as reported, but, like other sheep, turn their backs on it; and, in such weather, they generally gather together, and keep stirring about; by which means they tread down the snow, keep above it, and are rarely over-blown.

The loss per cent. per ann. is of *bogs** from 5 to 10.—
Ditto ditto of old sheep—2 to 5.

* Provincial term for sheep, from six months old, till being first shorn.

The ewes are kept as long as they will breed lambs, and are often from ten to fifteen years of age before they are sold: the wethers go off at four and a half years old. Both ewes and wethers are sold from these mountains, and killed without being put on any better pasture: we saw a carcase of one of the wethers at Ravenglass, very good mutton, which weighed 11 lb. a quarter, and had 10 or 12 lb. of tallow. The ewes weigh from 6 to 8 lb. a quarter; the fleece weighs 2 lb. and sold last year at 6d. per lb. which we think much below its value.

The mountains on which these sheep are bred, happen not to be common, but belong to Lord Muncaster; as do also the stock that depasture them, which have, time immemorial, been farmed out to *herds*, at a yearly sum. From this circumstance, these farms (three or four in number) have obtained the name of *Herdwicks*; that is, the district of the *herds*; and the sheep, the appellation of *Herdwick sheep*. They have obtained such a character for *hardiness* of constitution, that Mr Tyson,* who farms the principal flock, sells a number of tups every year into various parts of the county, to *improve the hardiness of other flocks*; the price is often as high as two guineas and a half.

The sheep, through the whole of this county (except the *Herdwicks*) have been descended from the *black-faced, coarse-woolled, heath sheep*; but by crossing with some other kind, (probably the *Herdwicks*) many of them have acquired a large portion of *white* on their *faces* and *legs*; some have those parts speckled, and others totally black; they are in general horned, high shouldered, narrow backed, flat sided, strong boned, and many with thick, rough, hairy legs. The *wool* is coarse and long, but falls short in

* We were told by Lord Muncaster's agent, that the family of Tysons have lived in this sequestered spot above four hundred years.

both these respects to what is produced by the black-faced sheep from Moffat and Linton in Scotland, and the Kentmore sheep in Westmoreland; the fleece weighs from 3 to 4 lb. which sold in 1793 for 5¹/_d. per pound.

The management of sheep, over all this county, is very similar; through the Summer the whole flock is depastured on the commons, and range at large without any person to look after them: in November, the whole are gathered together and salved;* the old sheep are turned again upon the common, but the hogs are kept in the old inclosures; some part of which has been kept uneaten, to support them through the Winter: on the approach of snow, the old sheep are brought to the inclosures, or to some part of the common adjoining, and are daily foddered with hay, while the storm continues. Those who have not a sufficiency of inclosed ground for wintering their hogs, take wintering for them, in those parts of the low country where they do not breed sheep; the price, 2s. per head, to have hay in bad weather.

In Eskdale and Mitredale, they formerly kept their hogs in the house all Winter on hay, and drove them to water once a day; but this practice is now laid aside, and they winter them upon the inclosed grounds, which are previously kept fresh for that purpose. They give no hay to their sheep here, which are a good deal of the *Herdwick blood*.

The sheep are sold in Autumn, to graziers. The price of those from the eastern part of the county, are,

Wethers at 3 ¹ / ₂ years old,	-	-	11s. to 13s.
Ewes from 6 to 8 ditto,	-	-	6s. to 7s.

* The salve is composed of butter and tar, in the proportion of sixteen pounds of the former to four quarts of the latter. This quantity will salve forty sheep.

From the south-west ;

Esfdale wethers at $4\frac{1}{2}$ years old,	-	10s. to 13s.
Ewes from 6 to 10 ditto,	-	4s. to 6s.
Skiddaw wethers at $4\frac{1}{2}$ ditto,	- -	13s. to 14s.
Ewes from 5 to 6 ditto,	- -	6s. to 8s.

We have no hesitation in saying, that the breeds may be improved, for there are few places where they have been more neglected. At Penruddock we observed some singularly rough legged, ill-formed sheep ; on asking an old farmer, from whence they had that breed, or where they got their tups ? He innocently replied, *Lord, Sir ! they are sik as God set upon the land, we never change any !* The latter part of this simple statement we readily believe ; but that God *set upon the land* such ill-formed, unprofitable animals, we cannot so readily assent to ; and rather think, they have acquired their present ill-form, and bad properties, by the indolence and ignorance of the owners. We wish we could avoid adding, that the same practice which guides the men of Penruddock, is too prevalent in every part of the county.

We found, in general, that the sheep breeders here, like those in most other countries, are very much attached to their own breed. As they have never tried any other, they cannot be admitted as proper judges, of the comparative merit of different kinds of sheep ; but supposing, for the present, their own breed to be well adapted to their situation, why not improve them, by selecting the best males and females, and rear a better offspring of their own kind ? or, by hiring, or buying, some of Mr Tyson's BEST FORMED and FINEST WOOLLED Herdwick tups, instead of getting tups from Kentmore in Westmoreland, which appeared (from what we saw) to have nothing to recommend them, (in our opinion) but *size and coarseness*. The shape of these sheep is, in every respect, the reverse of what it ought to be ; the back narrow,

row, the carcase long and thin, supported upon large rough legs, with coarse hairy wool hanging down from their throats all the way to their breast, which, on a wet day, gives them as much the appearance of goats as sheep.

Within the last three years, a few long-woolled sheep have been introduced into this county, from the Yorkshire Wolds, by Lord Muncaster; from Northumberland, by Mr Blacklock, of Corby; Mr Richardson, of Rickaby; Mr Porter, Carlisle; Mr Falder, near Roes Castle; Mr Lamb, Netherby; and probably a few others:—and since our visiting this county in 1793, to the above names we are happy to add those of Mr Graham, of Barrock Lodge; Mr Losh, of Woodside; Mr Stalker, of Lambsknow, &c.; who have not only hired tups at considerable prices, but even purchased ewes at as high prices, as from 4l. to 5l. each.

SECT. 3.—*Horses.*

The Horses are middle sized, from fourteen to fifteen and a half hands high, of various colours; but bays and chestnuts seem the most prevalent; for a small farm, where horses must answer for both draught and riding, they are probably most suitable; but certainly might be improved, by stallions from the North-Riding of Yorkshire, the best breed of horses we know for the double purpose above-mentioned.

About 70 or 80 years since, teams of oxen, or oxen yoked with horses, were very common; from that period, draught oxen gradually decreased; and for some years past we were informed, there has not been an ox team in the county.

Almost every small farmer breeds his own horses, and generally more than are necessary, for the cultivation of his farm; these are often purchased by dealers, for the purpose of supplying the light horse regiments.

SECT. 4.—*Swine.*

Swine are bred and fed here in considerable numbers; every farmer fattens one or more of these animals, and most labourers and mechanics rear and feed each a pig; at about 10 months old they are confined in the sty for the purpose of fattening on barley or oatmeal, and potatoes: their weight is from 15 to 20 stone.

SECT. 5.—*Rabbits.*

Some narrow tracts of light sandy ground along the coast, from Harrington to Abbey-holm, are occupied by rabbits. There are also warrens in the parishes of Wyberthwaite, Drig, and Hefkit.

SECT. 6.—*Poultry.*

The minute division of landed property occasions abundance of poultry: the numerous waters, lakes and commons, facilitate the keeping of large flocks of geese; which are fed on the stubbles, and supply the market plentifully, from the latter end of October, to Christmas.

SECT. 7.—*Pigeons,*

Are rarely found with the farmers; they are principally kept and bred by gentlemen of property, as articles of luxury.

SECT. 8.—*Bees,*

Are found thro' every part of the county, and in some situations are very profitable. It is a prevailing opinion, that they thrive best in the vicinity of Heath (*Erica vulgaris*.) Hence it would appear, that this plant abounds with their favourite food; but as it is late of flowering, they should also be in the neighbourhood of a sheltered early

early situation, to enjoy the benefit of the Spring flowers: where these cannot be united, it would probably be right to remove them from one to the other, to suit the seasons.

CHAPTER XIV.

RURAL ECONOMY.

SECT. I.—*Labour.*

FROM the number of small farms, there is an uncertainty of a day labourer meeting with constant employment; as the occupiers want assistance only on particular occasions.

On this principle we account for the high wages given in this county; through the whole of which, there is an universal custom of giving the labourers *viſtuals*, both men and women; the wages are,

For men, per day, 10d. and viſtuals; in harveſt, 1s. and viſtuals—For women, hay-making, 8d. and viſtuals;—harveſt, 10d. and viſtuals.—The hours from 6 to 6.

The viſtuals are eſtimated at 8d. per day for men, and 6d. for women. Servants kept in the houſe, are only hired for half a year, to prevent gaining ſettlements.—Their wages for that time are, a man, from 5l. to 7l.—Women, 2l. to 3l.—Maſons, without viſtuals, are from 1s. 8d. to 2s. per day; Carpenters, 1s. 6d.

When work is done by the piece, the prices are as follows:

	s.	d.
Threſhing wheat per buſhel	-	0 2
barley		

	s.	d.
— barley ditto	0	2
— oats ditto	0	1½
Ploughing per acre,	5	0
Reaping per acre,	5	0
Mowing ditto	2	6
Walling per square yard,	0	8

SECT. 2 — *Provisions.*

* Grain of all kinds is generally very high; the average price in 1793, was, s. d.

For wheat,	6	6	per bushel.
Barley,	3	8	ditto.
Oats,	2	8	ditto.
Butchers' meat from	0	3	to 4d. per lb.
Butter, from	0	6	to 8d. per lb.
Skimmed milk cheese	0	3	per lb.
Potatoes	1	0	to 1s. 4d. pr. bu.

Poultry.—A stubble goose, 2s.—duck 8d. a fowl 6d.
—eggs from 3d. to 6d. per dozen.

Fish.—Salmon, 6d. per lb.—trout 3d.

We suspect the butchers' meat, through all the markets of the county, is not overloaded with fat: what we saw at Carlisle and Whitehaven was lean indeed!—At the latter place, we did not see one carcase of decent mutton,—the greatest part of it would not have been suffered to appear in Newcastle, and many other markets, that are accustomed to see good mutton; a joint of lean Whitehaven mutton, is dearer at 3d. per lb. than the same joint of a good fat sheep is at 5d. on account of the greater proportion of bone to eatable meat, in the former, to what it is in the latter.

The bread, generally used in this county, is made of barley, or a mixture of barley and rye; oatmeal is made into
hasty-

hasty-puddings, and eat with butter, treacle, milk, or beer, for breakfast, and often for supper.

Potatoes, for several years, have been in general use, as a principal article of food; few families dine without them; and we believe many a dinner and supper are made of potatoes, with a little butter, or cream, for sauce; and in many cafes, only milk, or, where this cannot be had, a little salt.

SECT. 3.—*Fuel.*

Coals are cheap and plentiful in most parts of the county; in several places from 15s. to 30s. will procure a year's fuel, for a small family.

Peat and turf also abound, and are used instead of coals in some districts.

CHAPTER XV.

POLITICAL ECONOMY.

SECT. 1.—*Roads.*

THE *roads* are in general very good, both parochial and turnpikes, except the road from Carlisle to Newcastle; some parts of which are very bad, and very different to what the same road is, immediately on entering Northumberland.

The materials are excellent; in general lime-stone; but, in almost every instance, not broken small enough by one half. If these hard stones were broken so small,

as to pass through a ring two inches in diameter, and the roads made wider, and flat, or very nearly so, few counties in the kingdom would be able to vie with Cumberland for excellent roads.

SECT. 2.—*Canals.*

There are no canals in this county; in 1795, one was projected from Maryport by Carlisle, to Newcastle, but did not take place; owing to a difference of opinion, whether the canal from Newcastle, should pass on the North or South side of Tyne.

SECT. 3.—*Fairs.*

FEBRUARY.

20th.—*Wigton*,—for horses.

APRIL.

5th.—*Wigton*,—for cattle.

24th.—*Penrith*,—for cattle.

25th.—*Boon Wood*,—for cattle.

MAY.

First Wednesday, and every fortnight till Michaelmas.

—*Cockermouth*,—for cattle.

1st, 2d, and 3d Fridays.—*Hesket-New-market*,—for cattle.

28th.—*Aldston*,—for cattle.

JUNE.

8th.—*Ravenglass*,—for cattle.

Tuesday before Whitsuntide.—*Abbey-holm*,—for cattle and horses.

Whitsun Monday, the Monday fortnight, and Monday month after.—*Rosley-bill*.—A very great fair for cattle and horses: and cattle are shewn here every fortnight after, till Michaelmas.

Whitsun-

Whitsun-Tuesday: and every fortnight after.—*Penrith*,—for cattle.

Second Wednesday after Whitsuntide.—*Brampton*,—for cattle, horses, and sheep.

AUGUST.

4th.—*Ravenglass*,—for cattle.

26th.—*Carlisle*,—for cattle and horses.

SEPTEMBER.

2d. Wednesday.—*Brampton*,—for cattle, horses, and sheep.

18th. ——— *Egremont*,—for cattle.

19th. ——— *Carlisle*,—for cattle and horses.

26th, 27th. ——— *Penrith*,—for cattle.

OCTOBER.

10th.—*Cockermouth*,—for cattle and horses.

1st, 2d, 3d Saturdays, after Old Michaelmas.—*Carlisle*,—for cattle and horses: these are called *Emptons*, probably from the cattle being bought to drive to the great fair of Hempton Green, in Norfolk, held the 22d of November.

29th.—*Abbey-holm*,—for cattle and horses.

DECEMBER.

21st.—*Wigton*,—for cattle and Christmas cheer, from whence it is commonly called "*Wallet-fair*."

SECT. 4.—Markets.

Monday.—*Cockermouth*,—for corn, butchers' meat, &c.

Tuesday.—*Penrith*.—A large market for corn, and all kinds of provisions.

Wigton,—for corn, butchers' meat, &c.

Brampton.—A small market for corn and other provisions.

Wednesday.

Wednesday.—*Workington*.—A large market for all kinds of provisions.

Thursday.—*Whitehaven*.—for corn and provisions: a large market.

Longtown.—butchers' meat and butter; no corn.

Kirkcubald.—A small market for butchers' meat, &c.

Friday.—*Maryport*.—for provisions all kinds.

Hesket-New-market.—A small market for corn, butcher's meat, &c.

Ravenglass.—A small market for provisions.

Saturday.—*Carlisle*.—A very large market for corn, cattle, swine, butchers' meat, and provisions of all kinds.

Keswick.—A small market for butchers' meat, butter, &c.; and a few oats and barley.

Egremont.—for corn, and other provisions.

SECT. 5.—Commerce.

The Commerce of this county consists, principally, in the exportation of coals from *Whitehaven*, *Workington*, and *Maryport*, to *Ireland*, &c. The number of vessels employed in this trade amounts to upwards of 300, from 60 to 120 tons burden. This lucrative trade has arisen to its present importance, within the last hundred years; it originated at *Whitehaven*, from the exertions of Lord *Lonsdale's* ancestors, to whom the coal in that neighbourhood principally belongs.

Mr *Curwen* is the principal coal-owner at *Workington*, and Mr *Senhouse* at *Maryport*. At all those places, coal cannot be wrought fast enough to supply the demand; vessels have frequently to wait six or eight weeks before they

they can get a loading; a certain sign of an increasing trade.

“ We have not been able to ascertain at what period navigation was advanced in Cumberland. A survey was taken by commission from the crown, in the year 1566, of the trade and shipping of this county, (*inter alia*;) Whitehaven was then so far from promising it would ever arrive at its present wealthy and flourishing state, that it consisted only of *six cottages*, scattered on the beach, and hidden in the creek from the eye of an enemy, and to this dejected port one small bark only belonged, of nine or ten tons burthen. Nay, it is not more incredible than true, that there was at that time only one vessel appertaining to the whole county, that was of ten tons burthen. The whole exports of this extensive county, were nothing but a small quantity of *herrings and cod fish*; and the inhabitants knew so little of the luxuries and enjoyments of life, that the whole of this great coast received no other *imports* than a little salt.

About the year 1582, the Earl of Lincoln being Lord High Admiral, caused an account to be taken of the ships and mariners within this county; when all the vessels amounted only to twelve, and not one carried eighty tons. The number of mariners and fishermen were 198, of whom many had never navigated a vessel superior to an open boat.

In 1607, *Workington* was the chief haven, and the place from whence certain criminals, sentenced to banishment, were exported to Ireland.*”

Maryport, in the year 1752, consisted of only one farmhouse; in that year another house was built. It is now a neat, well built, middle-sized market-town, with a small and good harbour, inclosed by two piers; and in

* Hutchinson's History of Cumberland.

1793, contained 3445 inhabitants, which increase about 100 yearly. The ground upon which the town is built, belonged to Humphry Senhouse, Esq. To encourage settlers, he sold off house and yard steads, reserving a ground rent. The land around it lets for 2 or 3l. an acre, which would not have been worth more than 1l. had things remained as they were in 1752.

The quantity of coals exported from these ports, taken on an average of 11 years, (from 1781 to 1792) is as follows:

	Chaldrons.
From Whitehaven	81940
Workington, Harrington, and Maryport	70870
	152810

The receipt of customs at Whitehaven, from 17th June 1794, to 5th January 1795, (29 weeks) was 19832l. 17s. 8d.

The duty on coals exported from these ports, is 1s. 2d. per chaldron to Ireland, and 5s. to foreign ports.

Butter, bacon, and hams of an excellent quality, form a part of the commerce of this county. The article of butter, is said to amount to 30000l. per ann: the whole chiefly for the London market; to which place, also, considerable quantities of fresh salmon are sent from Carlisle.

SECT. 6.—*Manufactures.*

The Manufactures are not extensive: printing cottons at Carlisle, and a check manufacture (on a small scale) in most of the market towns, with four or five cotton mills, erected of late years near Carlisle, Dalston, and Corby, with a small factory of corduroys at the latter place, is all this county has to boast of.

Whether

Whether the coal trade and manufactures have occasioned any improvements in the agriculture of the county, is doubtful; but they certainly have encouraged it, by making a very increased demand for its produce.

The lead mines on Aldston-moor affect the agriculture of this county very little, being more intimately connected with Northumberland.

SECT. 7.—*Poor.*

In most of the country parishes, the poor-rates are low, from 6d. to 9d. per pound; which, we believe, is partly owing to a sort of pride existing amongst the lower classes, of not applying for parochial relief, till they cannot possibly subsist without it; and also to the number of *Friendly Societies*, which have been established, and we hope are still increasing. Such useful institutions are deserving of encouragement, by every person whose property is chargeable with poor-rate.

SECT. 8.—*Population.*

In Messrs Nicholson and Burn's History of Cumberland, published in 1777, the number of houses are estimated at 20,000, and the inhabitants at 100,000: by Houseman's notes, in Hutchinson's History of Cumberland, now publishing, they amount to 97,200.

CHAPTER XVI.

OBSTACLES TO IMPROVEMENT.

ONE great obstacle to improvement, seems to arise, from a laudable anxiety, in the customary tenants, to have their little patrimony descend to their children. These small properties (loaded with fines, heriots, and boon-days,* joined to the necessary expence of bringing up and educating a numerous family) can only be handed down, from father to son, by the utmost thrift, hard labour, and penurious living; and every little saving being hoarded up, for the payment of the *eventful fine*, leaves nothing for the expences of travelling, to see improved modes of culture and to gain a knowledge of the management and profits of different breeds of stock; and be convinced, by ocular proofs, that their own situations are capable of producing similar advantages. And even should they be half inclined to adopt a new practice, prudence whispers, that, should the experiment fail, it would require the savings of many years to make good the deficiency.

The *customary tenure* is allowed, on all hands, to be a great grievance and check to improvement. Would not this be best done away on the division of commons, as was the case at Brampton, &c. where Lord Carlisle had 1-2th for his consent as lord of the soil, and for enfranchising the allotments. There are other lords who ask 1-4th

* See Tenures, page 178.

for their consent and enfranchising.* The yearly value of the various customs, fines, &c. might be easily settled by commissioners; and twenty-five years purchase, on *this value*, be the price of enfranchisement, which might be allowed out of the allotment, upon the division of a common; or paid in money, at the option of the tenant.

On these terms, neither party would have reason to complain; but where a tenant cannot enfranchise, under forty years purchase, it would be a humane act of the legislature to relieve these bondagers, by law; or laudable in the Board of Agriculture, to induce such lords of manors, to accept a fair equivalent for these dregs of vassalage.

Letting no Leases, or leases for five or seven years, is another great obstacle to improvement. To such proprietors of land we would beg leave to hint, that no tenant will ever make improvements under the uncertainties of a *short lease*, much less where there is *none*. A tenant may be well convinced, that by proper culture, draining, improved breeds of stock, &c. he could make his farm, in a few years, worth *one third* more than it is at present; but this cannot be done without laying out money: suppose 100*l.* and suppose, by this means, the increased yearly value of his crop is 20*l.* Now it is clear, it will be six years before he can be repaid the principal and interest of the sum expended. Should his lease expire in the fifth year, he would be a loser; and should he have no lease, he might be turned off his farm at the end of the second year. Under such circumstances, the chance of loss is much greater than the prospect of gain. By reasoning in this manner, he concludes, that it is safer to have his 100*l.* at interest at 5 per cent. than risk it in

* The portion given to the lords of manors, for their consent as lord of the soil, in most parts of the kingdom, is one-sixteenth. The part to be allowed for enfranchising will depend on the nature of the tenure.

improving his farm under such uncertainties; and that it will be the surest game, to take *every advantage* of the farm in his power.

On the other hand, if his lease had been for twenty-one years, he would have foreseen, that, by laying out his 100l. he would gain 200l. and, as "the hope of reward sweetens labour," he would have doubled his exertions, and gone on from improvement to improvement; and at the expiration of his term, his landlord would have the satisfaction of seeing his tenant had acquired a competency, his farm increased in value, and the community benefited by the increased produce. We have heard, it is true, some arguments urged in favour of letting *no leases*; such as would have been used by a feudal lord, and which, we are persuaded, cannot long be held by liberal and benevolent minds, enlightened by science, or anxious to promote the true interests of their country.

The payment of Tithes in kind, is universally agreed to be a material obstacle to the advancement of agriculture: according to the present mode of collecting tithes, it is not a tenth of the *natural produce* of the land, but a tenth of the *capital employed in trade*. If a man employs 100l. in trade, he receives his profits, without any deduction; but if he should lay out this 100l. on a speculation of improving a piece of land, (say, draining a bog) he finds, if his scheme succeeds, that the produce is not all his own; the tithe owner comes, and takes away *one tenth*, (which is probably *all the profit*, after deducting common interest for the money expended;) and this, from off land that never afforded any tithe since the creation, nor *ever would have done*, had not this spirited improver laid out his 100l. on improving this bog, rather than employing it in trade, where he could have received at least 10 per cent. for his money. The bog would then have continued unprofitable, and the tithe owner would have received

no injury; for neither he, nor any of his predecessors, had ever reaped any advantage from it.—This obstacle certainly might be removed, by giving a fair equivalent for tithes.

CHAPTER XVII.

MISCELLANEOUS OBSERVATIONS.

SECT. 1.—*Agricultural Societies.*

THERE are none in this county, nor we believe has any attempt ever been made to form any.

SECT. 2.—*Weights and Measures.*

The same confusion in weights and measures prevails here, as in many other parts of the kingdom.

A Carlisle bushel, is 96 quarts *

A Penrith bushel, is 64 ditto, for wheat and rye.

80 ditto, for barley, oats, and potatoes.

A stone of tallow, wool, yarn, or hay, is 16 lb.

Ditto of butcher's meat 14 lb. but in many places 16 lb.

The pound is 16 ounces; by which butter, and various other articles are weighed.

• A Winchester bushel is 32 quarts.

CONCLUSION.

CONCLUSION.

MEANS OF IMPROVEMENT.

THE first that presents itself, is a reform in the culture of the arable lands. To those who have been accustomed to take two, three, four, five, &c. white crops in succession, we would recommend, to continue their lands in tillage *no more than three years at one time*; and in the second year to fallow for turnips, or wheat, according as the soil suits; after turnips, barley, or wheat; and on the barley or wheat, sow red clover, white clover, and ray-grass;* and continue in grass, two, three or more years, (according to situation and circumstances.) Where necessity urges, the clover may be mown for hay the first year; but would recommend to depasture it as much as possible with sheep, which of all other stock are the most profitable, and the most improving for land that has been exhausted by tillage.

It would probably be right, in most situations, to have one-third or one-fourth of the farm in old grass, for the purposes of the dairy, and the sheep stock in Winter; and we would observe, that where land is worth 40s. per acre in grass, it would be a dangerous experiment to plough it up, in such a climate as Cumberland possesses.

We know that in some parts of the kingdom, lands are let at higher rents, for the *purposes of tillage only*; but then, their soil, climate, and situation, are peculiarly good; and it is a question, whether, if these lands had been in old grass, they would not have been worth more for grazing, than they are at present for growing corn;

* To these may be added, hop-medic, and rib-grass, according to circumstances.

probably

probably as good as the land at Pap Castle, let at 3l. an acre, for grazing only,

The live Stock next offers itself for consideration. Of the properest breed of horses, and horned cattle, we have before given our sentiments: it only remains to suggest, what improvements may be made in the sheep; of which there ought to be at least two, if not three, distinct breeds; that is,

For the lower districts, a breed of *improved long-woolled sheep*:

For the mountainous, a breed of *mountain sheep*, adapted to the *herbage* and *situation*.

For the high, heathy ridge of mountains, on the east side of the county, the *true black-faced heath sheep* are probably the best adapted; as we think them the hardiest, and best calculated, for living *altogether upon heath*, of any other breed we know; of course a little attention to the improvement of the present breed, by good tups, of the *true heath sheep*, is all that is here wanted.—But for those mountains, on the south-west part of the county, which have *so large* a portion of sound green sward, we think a *fine-woolled sheep* might be kept to advantage; probably the *South Down*, or at least a cross betwixt the *South Down* and the *Herdwick sheep*; from the known inclination these breeds have to make fat, the carcase would certainly be as good, and the fleece would as certainly be of *double value*, as that of the present breed. £. s. d.

The fleece of the *South Down sheep* is $2\frac{1}{2}$ lb.

at 2s. per lb. - - - - 0 5 0

Ditto, of the *Skiddaw sheep*, $3\frac{1}{2}$ lb. at 5d. ditto 0 1 6

Increased value of the fleece, - 0 3 6

But it is probable the wool may be deteriorated, by crossing with the *Herdwick sheep*. If on this account we al-

low

low 1s. 6d. there will still be an increased value of 2s. a fleece.

For the lower districts, a breed of improved long-woolled sheep, of 18 or 20 lb. a quarter, would undoubtedly be far more profitable than those that are now bred and depastured upon it; and from the great portion of excellent turnip soil, distributed through every part of the county, almost every breeder would be enabled to fatten his own, if he pursued the rotation above recommended; and he would find, that his wethers at $1\frac{1}{2}$ or $1\frac{1}{2}$ year old, would be much fatter than the present breed are at 4 or $4\frac{1}{2}$ years old; and that they would be sold for the following prices:

	£.	s.	d.
A wether at $1\frac{1}{2}$ year old,	-	-	1 5 0
Wool, 1 fleece 8 lb. at 9d. per lb.	-	-	0 6 0
			1 11 0
Deduct for wintering on turnips 20 weeks			
at 4d. per week,	-	-	0 7 0
Produce of a long-woolled wether at $1\frac{1}{2}$ year old,			
after deducting the expence of wintering			
on turnips,	-	-	1 4 0
At Aspatria they feed their own sheep, and sell			
their wethers at $4\frac{1}{2}$ years old to the butchers			
for	-	-	1 0 0
Wool, 4 fleeces at 1s. 6d. each,	-	-	0 6 0
			1 6 0
Deduct for salving 4 years	-	-	0 2 0
Produce of a country bred wether $4\frac{1}{2}$ years old	-	-	1 4 0
			From

From hence it appears, that the present breed of sheep are kept three years for nothing, or that the improved breed of long-woolled sheep will leave as much profit in one year, as the present do in four; or a flock of 25 of these long-woolled sheep would leave as much profit as 100 of the present race, and that for grass only, as the expence of wintering on turnips was deducted in the above statement.

Inclosing of Commons,—we have already pointed out, would be a great source of improvement in this county, could it be done at a moderate expence, and on equitable terms; the charges of obtaining an act of parliament, and the various additions made thereto by the practitioners of the law, are in some cases three or four times more than all the other expences put together: Surely this might be avoided by a general act. The House of Commons has already laid a foundation, by the standing orders respecting such bills.—If two-thirds of the proprietors request a division, we see no reason why they should be put to the expence of obtaining an act of parliament, because two or three, or possibly only one, ignorant or ill-natured person or persons, are absurd enough to oppose it.

Watered Meadows—is another source of improvement, from whence great advantages may be derived; the streams are not confined to any particular district: they are found equally pure, whether they have their source from the limestone rocks, on the eastern and middle parts of the county; or from the immense mountains of blue slate rock, in the south-west district. Numberless are the rivulets that might be employed, with the greatest advantage in watering, and in most places would be turned over the land at the least expence; being obliged at present, to be kept within their bounds by proper fences, and seem to solicit their indolent owners to employ them, for their own emolument, and the benefit of the public.

There

There are also many fine opportunities for employing the larger rivers; some hundred acres of the flat tract of land below Keswick, to the top of Bassenthwaite-lake, might be irrigated, and prevented from being overflowed by embanking; a large portion near the foot of the lake, is capable of the same improvement. In Eskdale, Lord Muncaster has a fine opportunity of watering an extensive tract.*—Near Carlton, on the Pettril, on the Ellen, and at many other places, we observed, where irrigation might be applied to great advantage.

We made an excursion to the Bishop of Llandaff's, at Colgarth Park, where that respectable prelate has a most admirable situation for watering.—He purposes to have a man from those parts where the practice is best understood; a plan we highly approve; and from his known scientific acquirements, enlarged ideas, activity, and perseverance in every good pursuit, we have no hesitation in saying, that future improvers will revere his memory, and admire the man, for adding to the character of a *good bishop*, that of a *good farmer*; and for blessing these northern regions, by the introduction of a practice, from which so many, and such great benefits are to result.—To this place, we hope, the Cumbrians will resort, to be taught the most improved modes of irrigation; and by introducing the practice into their own country, will reap the rewards which it is so highly capable of affording, from this source of improvement.

Draining,—has been practised with great advantage, by a few enterprising individuals; but much remains yet to be done, in almost every part of the county:

* We are glad to find that his Lordship has taken the hint, and brought an experienced person from near Cirencester, in Gloucestershire, with a view of introducing this species of improvement into this county; he purposes irrigating about 200 acres, in different situations, and upon different soils, and with water of different qualities.

to those who are unacquainted with the benefits of draining, we beg leave to recommend it to their particular notice, as the first of improvements.

By *Embanking*, great advantages might be gained, especially on the marshes of Burgh, Rowcliff, Abbey-Holm, and at the mouth of the Duddon. To point out the mode by which this could be best accomplished, would require a more particular survey; it is sufficient, on this occasion, to hint, that it may be done, and that considerable benefits would accrue from it, not only to many individuals, but to the public at large.*

To the Notice of other Districts,

We would beg leave to recommend the use of *single-horse carts*; having been long convinced of their utility, we are glad to have an opportunity of stating to the public a few facts, which will fully evince their superior advantages.

The horses of Cumberland are not of a large size, one fifteen hands high, of a light form, that will answer either for riding or drawing seldom draws less in a single-horse cart than - - - - - 12 cwt.

The common load for a *draught horse* of the above size is, - - - - - 15

The carriers from Brampton to Newcastle, over a hilly country, carry frequently, - 18

We met a carrier's boy driving five carts from

* The south-west part of Cumberland is in a manner insulated, and cut off from all easy, safe, and ready communication with the southern and western parts of the kingdom; on the one hand, by the barrier of mountains which stretch from Kendal and Ulverstone, to Penrith and Keswick; and on the other, by the flow of the tides over the Lancaster, Cartmel, and Duddon sands; by which the passage is not only interrupted for several hours twice a day, but also rendered very unsafe and dangerous: all which might be avoided, by proper embankments, and at the same time a great quantity of land gained from the ravages of the sea.

Longtown to Newcastle; in which were
four ton; or on each cart, - - 16 cwt.

A single-horse cart carries ten pigs of lead, of
twelve stone each, which is - - 15

From the above it may be fairly concluded, that the
common load for a single-horse cart, will be about 15 cwt.

In most countries, a two-horse cart seldom car-
ries more than, - - - 20 cwt.

Nor a three-horse cart more than, - - 30

Here a boy or a girl drives two single-horse
carts, which carry - - - 30

Of course, *two horses*, yoked in *single-horse carts*, will draw
as much as *three horses* yoked in *one cart*.

A common carrier at Carlisle, who many years employ-
ed a waggon, has laid it aside, and now uses *single-horse
carts only*; as he finds he can, by that means, carry much
greater weights.

There are few articles which may not be carried on a
carriage of two wheels, equally as well as upon one of
four, except long timber; and as waggons are so destruc-
tive to roads,* why should their use be longer persisted
in, as it is clear that the same number of horses yoked in
single horse carts, will draw more than when yoked six or
eight together;—they are easier loaded and unloaded, are
much more handy, for almost every purpose; and six or
eight may be driven by a man and a boy, which is a trifling
additional expence. If a middle-sized Cumberland horse

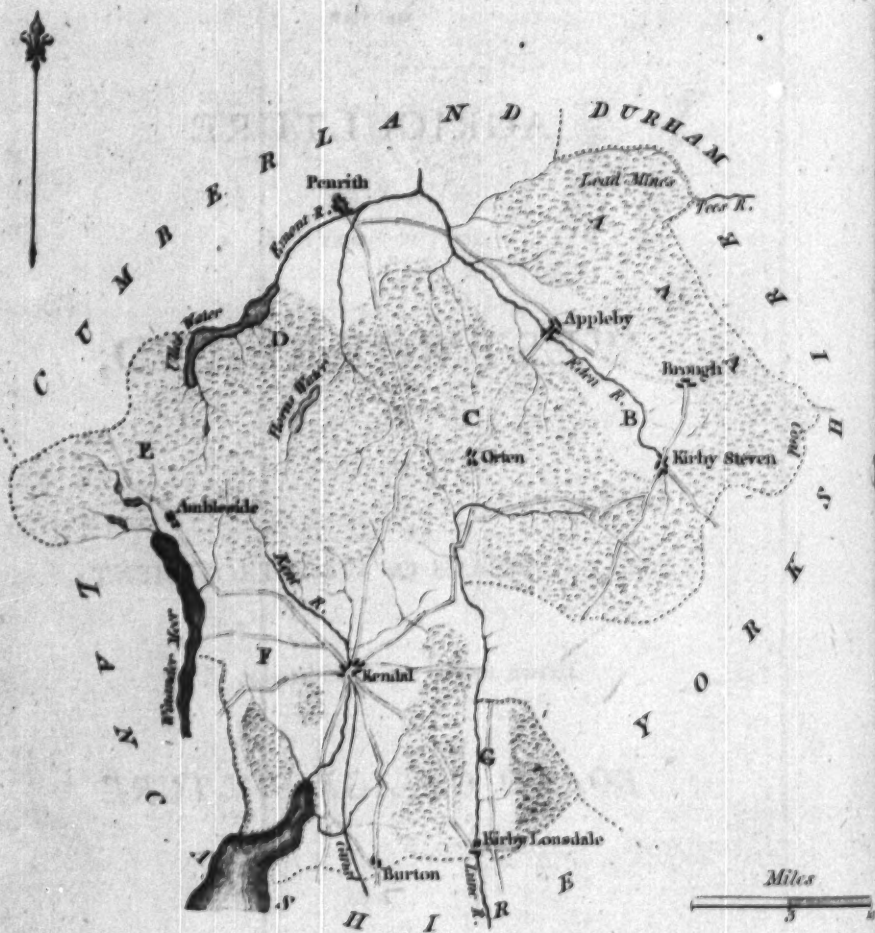
* The superior goodness of the roads in Cumberland may, in a
great measure, be attributed to the universal use of single-horse
carts.—Wherever waggons are used, they are the destruction of
roads, especially in hilly countries, where they are obliged to lock
the wheels; the banks are in a manner ploughed up with them,
and the nine inch wheels are, in reality, no more than three inch
wheels, by the artful mode of laying on the middle course of tyre,
which is raised an inch above the rest; instead of being nearly ex-
empted from tolls, every horse drawing in a waggon, ought to pay
treble to what should be exacted from a horse drawing in a *single-
horse cart*.

draws 15 cwt. a large strong waggon horse will as easily draw 20 cwt. and which is done in some parts of the kingdom.

For destroying Moles,—a most excellent practice is prevalent here, for every parish to let the taking of their moles, for a *term of years*, at a certain yearly sum; which is raised in the same manner as the parochial taxes, and does not now exceed a halfpenny an acre; which, they justly observe, was much cheaper than they could have the ground *scaled for*, were the moles not destroyed in this manner. It is a pity but there was a *law* to oblige every parish in the kingdom, to destroy their moles in the same manner; which is done so effectually here, that we scarce ever saw a mole-hill upon the inclosed grounds of most parts of Cumberland.



WESTMORLAND



AAA. Range of Mountains, Heathy, Coal, Lead, and Lime.

B. fertile Vale, of various Soils, chiefly moist Loam & strong Clay, Lime & Freestone.

C. light moorish Soil, Lime and Freestone.

D. Soil various, some rich grazing Land, Lime, Freestone, & a bed of poor Coal.

E. Mountainous District, interspersed with beautiful fertile Valles, no Freestone nor Coal, some black Lime stone, and plenty of the best blue Slate.

F. Sterile Vale, chiefly a good lime stone Soil, no Coal or Freestone.

G. Soil various, on the East Mountainous & Heathy, the rest partly a light sandy Soil, & partly a strong & rich Loam, plenty of Lime & Freestone, & some beds of poor Coal.

GENERAL VIEW

OF THE

AGRICULTURE

OF THE COUNTY OF

WESTMORELAND,

WITH OBSERVATIONS

FOR THE MEANS OF ITS IMPROVEMENT;

Drawn up for the Consideration of the

BOARD OF AGRICULTURE

AND

INTERNAL IMPROVEMENT,

BY

Mr A. PRINGLE,

OF

BALENCRIEFF.

CONSTITUTION

OF THE

AGRICULTURE

AND

WESTMORELAND

AND

FOR THE BENEFIT OF THE

PEOPLE OF THE COUNTY

BOARD OF AGRICULTURE

AND

WESTMORELAND

IN

WESTMORELAND

INTRODUCTION.

GR**EAT** Britain had long availed herself of her naturally fortunate position for commerce, which, encouraged by every means that the wisdom of the legislature could devise, had been carried to an extent hitherto unequalled in the universe; and the industry of her inhabitants, assisted by the fostering hand of government, had brought many branches of manufactures to the highest state of perfection; while the cultivation of her fields was left to the feeble exertions of the husbandman, aided only by bounties on the raising of flax, and on the exportation of corn. It was reserved for our days, to behold a Board, composed of the first officers of the state, and of persons equally respectable for high rank, distinguished abilities, and independent fortune, established to fix the attention of a great nation on the improvement of its soil, and to direct and assist in the ancient and most important of all arts, that of providing food for man.

The eyes of all Europe are already turned to this Board, which, it is believed, is the first national establishment, on a great scale, that ever existed in any country in favour of agriculture, and the advantages of which now appear so obvious that it is a matter of astonishment that such an institution was not sooner erected.

At the time of the landing of the Romans on this island, corn was raised only on the coasts, and even so late as the expedition of Severus, tillage was altogether unknown in those parts which lay between his wall and that of Antoninus. But, under the dominion of that wonderful

R

people,

people, it soon came to be considered as the granary of the western Empire, and immense quantities of corn were annually exported for the use of the armies in Germany and in Gaul; and in the year 359, when there happened to be an extraordinary demand upon the continent, Julian ordered eight hundred ships to be built, larger than the common barks, and sent them to Britain for grain. It is not possible to ascertain the capacity of these vessels, but it is probable, from privileges that were granted to those who built ships above a certain size, that many of them would contain more than ten thousand Roman modia, or upwards of three hundred English quarters.

Considering the change of manners, it is not to be expected, that the days of ancient Rome will be revived, when the most distinguished citizens united the culture of the liberal arts with the tillage of their fields, and when the highest Officers of the State, having left the helm of government, did not disdain to lay hold of the stils of the plough. When, however, we contemplate the rapid progress which agriculture made in this island, in the rude days of that superstitious people, who were governed in their time of sowing by the age of the Moon, and the setting of the Pleiades, what may not be hoped for from the spirit of an enlightened nation, fully excited and directed to its proper objects by the newly established Board, under whose auspices, were but the ravages of war to cease for a century, Great Britain would attain to an incredible degree of wealth and cultivation? Enjoying a soil of great original fertility, and a climate favourable to the growth of most branches of the vegetable kingdom, its craggy mountains and verdant hills would be cloathed with lofty timber, or bleat with innumerable flocks, its meadows would rear the stately bullock, and its fruitful plains would wave with the richest crops of every grain that the influence of a British sun can pour into the lap of plenty. The persevering

vering hand of industry would even teach trees and plants to flourish that at present are sickly and droop, and can hardly exist through the severity of an inclement winter. In a few centuries more, others might be cultivated with success, which, if directly transplanted to our climate, would immediately perish. When peaches were first raised in Italy, all the world was surprised that they could be brought to perfection out of Persia. What would Cæsar and Diodorus Siculus say, were they told that the most esteemed wines of Europe are produced in Gaul, Germany, and Hungary, where they imagined that vines would not grow? Or Strabo, if he knew that figs can be propagated in the north of Scotland? Or Lucullus, that cherries will grow almost any where, which in his time were known only in Cerasus, and the milder climates of Europe?

Trees and plants, being altogether passive, accommodate themselves very slowly to a change of climate; but the idea has been already* thrown out, that even those of the torrid zone *may* be made to flourish in northern regions, *may* become gradually inured to the climate, that the climate itself *may* be changed for the better, and that some thousands of years hence, reposing under their own olive trees, future Britons *may* quaff their own wine, or sip their own tea, sweetened with the juice of their own sugar cane.

* No apology is due to the author of J. W. Spencer's travels for the freedom that is here used with them.

PRELIMINARY OBSERVATIONS

THE BISHOP OF LANDAFF.

Extent of the County.

THE county of Westmoreland was surveyed in 1768, and a map of it, upon a scale of an inch to a mile, was engraved by Thomas Jeffreys, geographer to his Majesty, in 1770. It appears, from this map, that the greatest breadth of the county, from its southern boundary, near Burton, to its northern one, near Penrith in Cumberland, is thirty-two miles, and that its greatest length, from east to west, is forty miles.

I covered this map very exactly with fine writing paper, except the Estuary near Millthrope and Windermere lake; I then cut out a slip of the paper of an inch in breadth, and of ten inches in length, and weighed it accurately; from another part of the same paper I cut another slip, two inches in breadth and five in length, and found it to be precisely of the same weight as the first slip; and hence, as the surfaces of the two slips were equal, we may collect that the paper was of an uniform thickness. The area of each of these slips was ten square inches, and consequently covered a space on the map equal to ten square miles; I then weighed the whole of the paper which had covered the map, and by comparing the weight of the whole with the weight of what had covered ten square miles, I found

the number of square miles in the whole to be 844 ; now there are 640 statute acres in a square mile, and consequently 540,160 acres in the whole county.

I measured this map in the ordinary way by resolving it into triangles, and found its area to be equal to 636 square miles, or 407,040 statute acres.

Templeman, in his survey of the globe, makes the area of the county of Westmoreland equal to 633 square miles, and consequently, according to him, it contains 405,120 acres. The medium of these three different estimates (though I am most disposed to rely on the first) is 450,772.

Professor *Zimmerman*, in his political survey of Europe, estimates England and Wales at 54,112 square miles, amounting to 34,631,680 statute acres. *Templeman*, in the work above mentioned, says that England and Wales contain 49,450 square miles, or 31,648,000 statute acres; the mean of these two gives 33,139,840 statute acres for the whole surface of England and Wales, and hence the county of Westmoreland may, in superficial content, be esteemed a seventy-third part of England and Wales.

*Proportion between the Cultivated and Waste
Lands in the County.*

In 1689, when a bounty was first granted on the exportation of corn, one-third part of the land in England and Wales, or about eleven millions of acres, was supposed to lie in uncultivated commons ; if this was then a just proportion between the cultivated and waste parts of the kingdom, we may safely conclude, that much above one-third part of Westmoreland was then waste land ; as it is evident, from a bare view of the county, that few, if any counties in England, have, in proportion to their whole extent, so much uncultivated land as this has. The many inclosures which have taken place, during the
last

last hundred years, have lessened in some degree, the waste land of the whole kingdom; but no inclosures of much consequence have taken place in Westmoreland. Instead of one-third, I am disposed to conjecture that three-fourth parts of Westmoreland consist of uncultivated land. I will state my reasons for this conjecture, being as sensible as any person can be of the objections which may be made to it; but in a matter where there are no data to proceed upon, a conjectural argument may be allowed.

It appears, by the return made by the overseers of the poor to the House of Commons, that the sum raised by assessment in all the parishes and townships of the county, at a medium of three years, ending in 1785, amounted to 5,757*l.* The town of Kendall, including Kirkland, is the only large town in the county; it is found, by an actual survey made this year, to contain 8089 inhabitants, having experienced an increase of 518 inhabitants since the year 1784; of the present number 143, or about one fifty-sixth part of the whole, are *paupers* living in the workhouse. The poor rates of this town amounted, according to the same return, to 1125*l.* a year; this sum being subducted from the annual amount of all the poor rates in the county, leaves 4632*l.* for the sum raised from all the estates in the county, exclusive of Kendall. From particular inquiries in various parishes, I am of opinion, that the poor rates do not, in this county, exceed a shilling in the pound in the actual rental of all the lands; but a shilling in the pound (supposing the sum annually raised to be 4632*l.*) will give a rental of 92,640*l.* All the land in Westmoreland, which can either be ploughed or mown for hay, is worth at least a rent of a pound a statute acre on an average; and hence it may be inferred, that 100,000 acres of such land, or less than one-fourth part of the whole, would yield a rental equal to, if not exceeding, the rental of the county. The high inclosed rough

pastures are let from one to five shillings an acre. But whether the uncultivated land in Westmoreland be equal to three-fourths, or one half of the whole, it cannot be questioned, that there is so much of it, as to render its improvement a matter not only of individual concern, but of national importance.

Improvement of Waste Lands.

The uncultivated lands in Westmoreland are of various sorts, with respect to soil and situation, and capable of different sorts of improvement. Some of them consist of extensive commons in low situations, and are of an excellent soil; these might be improved by inclosures, without any risk of loss by the undertaking. Others constitute extensive mountainous districts, called by the natives *fells* and *moors*; the soil of these is, generally speaking, an hazel mould. In its natural state, it produces little else than a coarse bent grass, heath, and fern; or, in the language of the country, *ling* and *brackens*. Many of these fells are, in their present state, of so little value, that the liberty of keeping ten sheep on them may be hired for sixpence a year. Supposing six acres to be sufficient for the maintenance of ten sheep, the rent of such land is a penny an acre; and the price of the fee simple of it, at twenty-four years purchase, two shillings. Whilst there is an acre of such waste, improveable land in Great Britain, it may be hoped that, when the legislature shall turn its attention to the subject, no inhabitant of the island will be driven by distress, to seek a subsistence in Africa or America.

Above forty years ago an experiment was tried in Spain, with respect to the cultivation of waste lands. Several thousands of poor and vagabond people were settled on them at the expence of the government. If this experiment has succeeded (which may be easily known,) so far, as that the land has been made productive,

tive, that the settlers have been increased, and that the government has been reimbursed the whole or a principal part of its expence, it may induce other governments to adopt the same or a similar plan. The giving a cottage, and a few acres of land, under a small reserved rent, and perhaps under other useful restrictions, to a poor man, is certainly a good way of improving the land. When a man has lands of his own, he and his family will exert in its cultivation, a quantity of labour which would not otherwise be brought into existence. The value of this, otherwise non-existing labour is, in one respect, nothing; it ought not to be reckoned as a part of the expence attending the improvement of the land; and, on that account, many thousands of acres of land might be brought into cultivation, which would not, in any other way, pay the expence of improvement. The manner of improving moor-land, by paring, burning, liming, &c. is well understood by some few individuals, and the advantage resulting from it ascertained, by what has been recently practised in some parts of the county on private estates.

There are many barren mountains in this county which do not admit improvement by paring and burning, and which are incapable of being profitably converted either into arable or good pasture land: yet the highest and most craggy parts, two acres of which do not afford sustenance for six months in the year to one sheep, might, with a great prospect of success, be planted with larches; I say with a great prospect of success, for I do not speak with certainty, not knowing whether there are in Great Britain any plantations of larch made on such exposed and rocky situations as are here spoken of: But, on the other hand, it is known, that the larch grows in Italy on higher mountains than any that we have in this island, and not only that it grows in Italy, where the climate is
less

less severe than in Great Britain, but that it grows in the north of Russia, where it is much more severe; for at Archangel, in the latitude of 64° , ships are built of larch growing in that climate.

It may be of use to state the probable profit which would attend planting the land in question with larch: A thousand acres of this sort of land might be inclosed with a circular wall six feet in height, (where the stones can be easily gotten, as they may in most parts,) after the rate of six shillings an acre, or 300*l.* for the whole; five hundred larches, two feet in height, (so as to enable them to resist the long grass,) might be planted on each acre for fourteen shillings; hence a plantation of 500,000 larches might be made for 1000*l.* Now 1000*l.* improved at compound interest, at the rate of 4*l.* per cent. would, in sixty years, amount to the sum of 10,519*l.*; this is the accumulated loss attending the inclosing and planting 1000 acres of rocky land in sixty years. The rent of 1000 acres, at one penny an acre, is 4*l.* 3*s.* 4*d.* a year; in eight years the larches would be out of all danger from sheep, so that the loss of rent ought only to be estimated for eight years; but 4*l.* 3*s.* 4*d.* a year, though improved after the same rate of compound interest, would not amount to 40*l.* in eight years; say, however, that it would amount to 81*l.* which is allowing more than two pence an acre for the annual rent of the land, then would the whole expence attending the plantation in sixty years be 10,600*l.* If the amount of 81*l.* for 52 years, be taken into consideration, the expence of the plantation in 60 years will be 11,222*l.* I have here supposed sheep to be shut out of the plantation for eight years; if it should be found, that sheep will not crop the larch, and from more than one observation, I have reason to believe that they will not, they need not be shut out at all; nor, on districts, where nothing but sheep are depastured, need any

any fence be made. I know the advocates for close planting, instead of 500, would require 5000 larches for each acre; I am not convinced of the utility of such close planting, except where it is intended to nurse up oaks, or other kinds of wood; but if that mode should be adopted, the thinnings, after twenty years growth, would pay the expence of it. At the expiration of sixty years, suppose that only 250 larches remained on each acre, or that one half had perished; the probable value of them may be thus estimated. From a great many experiments made by myself and collected from others, I find the annual increase in circumference of the larch, at six feet from the ground, to be one inch and one half on an average of several years; and this inference has been drawn from the actual admeasurement of larches in different parts of England and Scotland, and of different ages, from ten years old to fifty. On this supposition, the larches would measure, one with another, ninety inches in circumference, at six feet from the ground. A larch which measures ninety inches, at six feet from the ground, would measure above seventy at twenty feet from the ground; but supposing seventy inches to be the circumference at twenty feet, and the length of the tree to be forty feet, neglecting the remaining top; then will its solid content be eighty-five cubic feet, and the value of the tree, at ninepence a foot, above three guineas. But as the trees are supposed to be planted in an high, bleak, barren situation, their annual increase may not be so great as is here supposed; instead of being worth, at sixty years after planting, three guineas a piece, admit that they are worth only ten shillings each, then would the whole plantation be worth 125,000*l.* and deducting the whole expence, 10,600*l.* as before estimated, there would remain a profit of 114,400*l.* The present value of 114,400*l.* to be received sixty years hence, is above 10,000*l.* (interest of money

money at 4l. per cent.) Ten thousand pounds at 4l. per cent. purchases an income of 400l. a year: by planting then, a barren estate, of a thousand acres, is improved from 4l. 3s. 4d. to 400l. a year, reckoning the value of a reversion as a present certainty. Sixty years is a great part of the life of a man; but it ought to be considered as nothing in the existence of a nation, or even of a family, which is a little nation. The waste lands in this and other counties, are a public treasure in the hands of private persons; all of them ought to be converted into arable, meadow, or pasture land, which are capable of admitting, with profit, that kind of improvement; and such of them as will not pay for that mode of improvement, ought to be covered with wood; the high parts, and especially the sheltered dells in the high parts, with larch, and the lower with oak, ash, &c. When a spirit of agricultural improvement is fully excited, the individuals to whom such uncultivated lands belong, will be prompted, by an attention to their own interest, to forward every judicious plan which may be proposed, for rendering them more useful to the proprietors and to the community; their present application to the Summer-maintenance of a few miserable sheep, ought not to be persevered in, if any other use can be made of them.

Coppices.

In some parts of Westmoreland, considerable portions of land are covered with coppices, consisting principally of oak, ash, alder, birch, and hazel. These underwoods are usually cut down every sixteenth year: The uses to which they are applied are chiefly two—hoops and charcoal. The hoops are sold in the wood at 5l. a thousand; they are generally manufactured in the country, and sent by sea to Liverpool; the charcoal is sent to the iron furnaces in the neighbourhood. The value of a statute acre
of

of coppice-wood, of sixteen years growth, is variable from 10l. to 15l.; and if it consists altogether of oak, its price may amount to twenty guineas; 6l. for the charcoal, and 15l. for the bark; it being the custom here to peel the bolls, and all the branches of the oak, which are equal to the thickn  s of a man's thumb.

It is an extraordinary thing, to see any trees left to stand for timber in these underwoods, the high price of bark being a temptation to cut the whole down. Fine saplings, from nine to twelve inches in circumference, at five feet from the ground, and with bark as splendid as polished silver, are felled by the unfeeling proprietor, with as little regret as if they were thorns or briars. Of late, indeed, some few owners of underwoods have left standards, and if they consult their interest, the practice will become general. As this is a point denied by many proprietors of coppices, it may be of use to explain the principles on which the observation is founded.

Suppose a statute acre of underwood to be, in the spring of 1794, sixteen years old, and that the whole is then cut down and sold for 14l.; this sum will, in sixty-four years, (reckoning compound interest at 4 per cent.) amount to 172l. In 1810 another fall of underwood, of the same value, will be made; the 14l. then arising, improved for forty-eight years, in the same way, will produce 91l. In 1826 another 14l. will arise from another fall of the underwood; this sum, improved for thirty-two years, will amount to 49l. In 1842, another fall will produce 14l. which, in sixteen years, will become 26l. And lastly, in 1858, or in sixty-four years from 1794, another fall will produce 14l. The amount of the value of the five falls, thus estimated and improved, will be 352l. Let us now calculate the profit which would result, in the same time, from the same acre of underwood, if it was managed in a different way. Instead of cutting the

the whole down in 1794, let us suppose that 150 of the best young oaks are left to stand for timber; the then value of these, at 2d. a tree, is 25s. this being subducted from 14l. the value of the whole coppice, leaves 12l. 15s. This sum, improved as before, will amount, in sixty-four years, to 156l. (shillings and pence in these calculations being neglected.) The next fall in 1810 ought not to be valued at more than 10l. as 150 trees, then of thirty-two years growth, will do some injury to the underwood: 10l. in forty-eight years will amount to 65l. The next fall in 1826 may be valued at 8l. and at that time seventy-five trees should be taken down; these trees will then be forty-eight years old, and worth 15s. a tree, or 56l. in the whole; this added to 8l. the value of the then underwood, makes 64l. which, in thirty-two years, will produce 224l. Without estimating the underwood in 1842, and in 1858, at any thing, or the value of the pasturage for thirty-two years at any thing, let us suppose the seventy-five remaining trees to be cut down in 1858, being then eighty years old, and that they would, one with another, be worth 4l. a-piece, or 300l. in the whole: The sum of the profits, thus arising, is 745l. or more than double the other amount.

It is a general opinion in this, and, I believe, in other countries, that it is more profitable to fell oak wood at fifty or sixty years growth, than to let it stand for navy-timber to eighty or one hundred. According to the price which is now paid for that commodity, either by the Navy-Board, or the East India Company, I believe the opinion to be founded in truth. The following observations contain the reason for this belief.

If profit is considered, every tree of every kind ought to be cut down and sold, when the annual increase in value of the tree, by its growth, is less than the annual interest of the money it would sell for:—this being admitted

mitted, we have only to inquire into the annual increase in the value of oaks of different ages.

In the Philosophical Transactions, for 1759, there are some useful tables respecting the growth of trees, by Mr Marsham; from these tables the two following inferences may be drawn:—

1. That it is highly profitable to let young thriving oaks, which are not worth above 30s. a tree, continue standing.

2. That it is not profitable to let oaks of 80 or 100 years growth, continue standing.

Three oaks, marked in the tables, No. 8, 11,—12, in April 1743, before they began to shoot, contained eleven and one half feet of wood, and were altogether worth, at eighteen pence a foot, bark included, 17s. 3d. The same trees, sixteen years afterwards, contained thirty-four and one half feet, and were worth 2l. 11s. 9d. Now, if 17s. and 3d. had been improved at the rate of 7 per cent. at compound interest for sixteen years, it would not have amounted to 2l. 11s. 9d.; and of consequence the proprietor, by letting such oaks stand, improves his property in as high a degree, as if he put out his money to interest at near seven and a half per cent.

Three oaks, No. 2,—3,—5, in 1743, contained 100½ feet of timber, and were worth 7l. 10s. 9d. The same trees, sixteen years afterwards, contained 132½ feet, and were worth 9l. 18s. 6d. Now, 7l. 10s. 9d. the value of the trees in 1743, improved, at the low rate of interest of 2l. per cent. would, in sixteen years, amount to a sum exceeding 9l. 18s. 6d. The proprietor, then, by letting such trees stand, does not improve his property at the rate of 2l. per cent.

The oak, No. 1, in the third table, was worth 1l. 2s. 6d. in 1757, it gained in one year one foot, or 1s. 6d. in value; if it had been worth 30s. and had gained one foot, there

there would have been no profit in letting it stand, as the interest of 30s. at 5 per cent. would have produced rs. 6d. in the year; and it is for this reason that I have fixed upon 30s. as the value of trees which should be cut down; if they are cut sooner or later, the proprietor will be a loser. It must not be supposed, however, that great precision can attend this observation; since particular soils, or the greater or less thriving condition of the wood, may render it useful to cut down trees before they are worth 30s. or to let them stand a while longer. It ought to be remarked also, that large trees sell for more per foot than small ones do, yet the usual increase of price, is not a compensation to the proprietor, for letting his timber stand to a great age. This may be made out from the following experiment:

On the 27th October 1792, I measured, at six feet from the ground, the circumference of a very fine oak, of eighty-two years growth, from the time of its being planted, and found it to be 107 inches: On the same day of the month, in 1793, it measured 108 inches.— There is not one oak in fifty (at the age of this) which gains an inch in circumference, in one year. The length of the boll of this tree was about eighteen feet; it contained about eighty-four feet of timber, and was worth, at 3s. a foot, 12l. 12s. It gained in one year very little more than a foot and one half of timber, or 4s. 6d. in value; but the interest of 12l. 12s. at 4l. per cent. amounts, in one year, to above twice the value of the increase, even of this tree, which is a singularly thriving one.

I have been the more particular on this subject from a public consideration. Many men are alarmed lest our posterity should experience a scarcity of oak timber for the use of the navy; and various means of increasing its quantity have been recommended with great judgment.

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In addition to these means, the making a much greater than the ordinary increase of price on timber of a large scantling, might be not improperly submitted to the consideration of those who are concerned in the business. If the Navy-board would give 8l. or 9l. a load for timber trees containing 100 cubic feet or upwards, instead of 4l. or 5l. every man in the kingdom would have a reasonable motive for letting his timber stand till it became of a size fit for the use of the navy; whereas, according to the present price, it is every man's interest to cut it down sooner.

In the neighbourhood of Ambleside there is found a stratum of gray limestone, which, though it contains a little clay, might be as serviceable as the purest sort for agricultural purposes; but, unfortunately for the improvement of this part of the county, coal is so dear, that very little of this limestone is burned. The lime which is used in the culture of the lands being either fetched from Kendall, or brought up Windermere lake, at a great expence. As there is great plenty of coppice wood in the district here spoken of, it may be useful for the farmers and land-owners to consider, whether the burning of lime with fagots in a flame-kiln, as is practised in Sussex, may not be a more beneficial application of the underwoods than the converting them into charcoal. Even the spray-wood, here called *chats*, which is too small to be made into charcoal, and which is now sold for sixpence a cart, or more generally left on the ground, might be made into fagots, and mixed with wood of a larger size, so that no part of the coppice would be lost. In Sussex they use 600 fagots, cut in the Winter, and weighing, when dry in the Spring, thirty-six pounds each, for the burning of 480 Winchester bushels of lime.

May I be permitted to hazard another conjecture, respecting the use to which coppices might be applied,

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without injuring either the quantity or the quality of the charcoal obtained from them? Pit coal yields, by distillation, about a twenty-fourth part of its weight, of a thick tenacious oil, resembling tar. All sorts of wood yield a similar oil by the same process: I do not know whether the oil from wood be of an inferior, or of a superior quality to that from pit coal; but I suspect it to be fitter for cordage, &c. In the ordinary way of making charcoal, the whole of this oil is dispersed in the form of smoke; may it not deserve to be inquired, whether this oil might not be saved with profit? The process which is used in America, for extracting tar from the pine tree, is little different from that by which charcoal is made in England. Whether the quantity of oil which might be obtained from a pit of wood, when converted into charcoal, would exceed in value the expence of procuring it, can only be decided by experiment. The reader may form some guess at the quantity, from the following statement: The black part of guaiacum wood yields a tenth, the sappy part a thirteenth part of its weight, of thick black oil. Sassafras wood, oak, ash, alder, birch, &c. give by distillation, (and making charcoal is a species of distillation) from a twenty-fourth, to a twelfth part of their respective weights, of this oil. The difference in quantity arises from a diversity in the texture, age, and dryness of the woods. I suppose that a cord of coppice wood would weigh a ton, and that four cords would make one dozen of sacks of charcoal, and that wood of this sort would yield a twentieth part of its weight of oil; on these suppositions there is dissipated in making one dozen of charcoal, 448 lbs. of oil, or one ton in every five dozen.

CHAPTER I.

GEOGRAPHICAL STATE AND CIRCUMSTANCES.

SECT. 1.—*Situation and Extent.*

WESTMORELAND is situated between $54^{\circ} 11' 30''$, and $54^{\circ} 42' 30''$, N. lat. and between $2^{\circ} 20'$, and $3^{\circ} 12'$, long. W. from London. It is an inland county, bounded on the N. by the bishopric of Durham and Cumberland, on the W. by Cumberland and Lancashire, on the S. by Lancashire and Yorkshire, and by Yorkshire and Durham on the E. ; and contains, according to the Bishop of Landaff's Preliminary Observations, about 844 square miles, or 540160 statute acres: three fourth parts of which, he conjectures to consist of uncultivated land.

SECT. 2.—*Divisions.*

Westmoreland is divided into East Ward, West Ward, Kendal, and Lonsdale Wards; and consists of 26 parishes.

SECT. 3.—*Climate.*

The climate of this county, as may be expected from its vicinity to the western ocean, over which the south-west winds blow for eight months of the year, and bring the exhalations to descend in rain on the mountains, is remarkably moist. The quantity of rain that falls in the west part in a year has been ascertained by rain-gages

kept at Kendall, and on the banks of Windermere. In the wet year, 1792, it amounted to eighty-three inches. In ordinary years it amounts to forty-five or fifty inches, the lowest of which is twenty inches above the medium quantity that falls in Europe. The air, however, is pure and healthful, the Winters rather long and severe. In the Winter 1791—92, thirty-six pounds were paid for cutting only a horse track through the snow upon less than ten miles of the road from Shap to Kendall.

SECT. 4.—*Soil and Surface.*

The county in general is so mountainous and hilly, that a great proportion of it must for ever remain undisturbed by the plough. Between these mountains there are several very pleasant and fertile vallies, that want only trees and hedge-rows to be truly beautiful. The most prevailing soil in Westmoreland, is a dry gravelly mould; sand and hazel mould appear in various parts, but chiefly in the E. and N.; clay is found on a few farms towards the Eden and Eastern mountains, and a heavy moist soil on others in the N. parts of the county. Peat moss makes its appearance in small patches in many of the vales, and abounds on the tops of several high mountains, which, however, are in general covered with a dry soil, upon a hard blue rock, provincially called *rag*. The soil that lies upon a limestone bottom is uniformly esteemed the best.

SECT. 5.—*Minerals.*

Notwithstanding its mountainous surface, no valuable mines have yet been discovered in Westmoreland. Some trifling veins of lead-ore, have been found in the Eastern mountains: coal is wrought only in the S. E. extremity of the county, and in the neighbourhood of Shap, where a bastard or crow coal is got.

Limestone

Limestone, in almost inexhaustible abundance, is to be found in most parts of the county, except among the Western hills, which afford an excellent kind of blue slates, well known over almost all England.

Gypsum is got at Acron-bank, near Kirkby-Thore, and a few other places: it is used for laying floors, but not at all as a manure.

Free-stone is found in the Eastern parts of the county, and at Hutton-roofe, about 10 miles from Kendall.

On the river Kent, about 3 miles below Kendall, a vein of beautiful marble was discovered, about four years ago, in the lands of Daniel Wilton, Esq; of Dallam-Tower, by some workmen who were building a barn, and the main quarry has been opened on the estate of that gentleman. It has lately been found on the opposite side of the river, in the property of — Strickland, Esq; of Syzergh.

SECT. 6.—*Water.*

Rivers.—Of the numerous streams that rush from the mountains and water the vallies beneath, there are only three that preserve their names to the ocean. The Eden, which springs in Mallerstang, and having received in its course the Eamont and the Lowther, and many little rivulets, enters Cumberland, and running the whole length of that county, empties itself into the Solway Firth below Carlisle. The Kent rises in Kentmere, washes the vale of Kendall, and loses itself in the Estuary near Milthrope, the only seaport in the county. The third is the Lon or Lune, which has its source in Ravenstonedale, and flows through the vale to which it gives its name, till it enters the county of Lancaster, below Kirkby-Lonsdale.

Between the mountains several extensive lakes are formed, the beautiful verdure of whose banks, with their shady groves, limpid waters, and pebbly bottom, are par-

ticularly described in *the Guides to the Lakes*, offered to every traveller who visits this part of the kingdom.

The rivers and lakes abound with many different kinds of fish, great part of which is now carried to Lancaster and Liverpool.

CHAPTER II.

STATE OF PROPERTY.

SECT. 1.—*Estates and their Management.*

A Large proportion of the county of Westmoreland is possessed by a Yeomanry, who occupy small estates of their own from 10l. to 50l. a year. The remainder consists of larger estates belonging to Noblemen and Gentlemen, several of whom are resident in the county, and take the management into their own hands. Others entrust the care of their affairs, in a great measure, to stewards.

SECT. 2.—*Tenures.*

The larger estates in Westmoreland are commonly freehold, and the small tenements, mentioned in the last section, are generally held under the lord of the manor, by *customary tenure*, which differs but little from that by *copyhold*, or copy of court roll. In some manors the tenant pays only a heriot, and fine certain, on death of the lord or tenant; in others the fine is arbitrary, on death or purchase. On customary estates, the wood is generally claimed by the lord of the manor.

CHAPTER III.

BUILDINGS.

SECT. 1.—*Houses of Proprietors.*

FROM the short residence the Author of this Report made in Westmoreland, he cannot pretend even to enumerate the various seats of the great proprietors throughout the county, and the neat snug boxes, belonging to gentlemen of moderate fortune, that adorn the banks of its beautiful lakes.

SECT. 2.—*Farm Houses, Offices, and Repairs.*

The lands of the *statesmen* and farmers in this county lie so intermixed that their habitations and offices, which are often built together in little straggling villages, must of necessity be very inconvenient for farming purposes; but convenience has been little studied even on those farms whose fields lie unmixed. The principal structure is a barn, which, at the same time that it has a stable and cow-house underneath, is frequently large enough to contain the whole crop of both corn and hay, so that it is rare to see a stack of either. These barns are often twenty yards in length, five in width, and five yards in height in the side walls. The expence of bringing all the materials from a moderate distance, and of building a barn of such dimensions with a slated roof, may be about seventy guineas. The houses are generally covered with slates, which are found in several parts of the county.

The slates are not nailed on boards, but hung with oak pegs on laths, and plaistered in the inside of the roof. A few houses are still thatched with wheat straw, which is sold from 1s. 2d. to 1s. 8d. a threave of twenty-four sheaves.

The expences of repairs are, for the most part, defrayed by the landlord.

SECT. 3.—Cottages.

There are very few mere cottages in the county; the labourer and mechanic generally reside in a small farmhouse, and occupy more or less land.

CHAPTER IV.

MODE OF OCCUPATION.

SECT. 1.—Size of Farms—Character of Farmers.

FARMS in general are so small, that it is rare to meet with one of 100l. a year of rent, though there are some of even 200l. or 250l. a year.

It might be useful to know what proportion of the lands in the county is possessed by that numerous and respectable Yeomanry already mentioned as occupying small estates of their own from 10l. or 20l. to 50l. a year. These men, in contradistinction to farmers, or those who hire the land they occupy, are usually denominated *statef-men*. They live poorly, and labour hard; and some of them, particularly in the vicinity of Kendal, in the intervals

tervals of labour from agricultural avocations, busy themselves in weaving stuffs for the manufacturers of that town. The consciousness of their independence renders them impatient of oppression or insult, but they are gentle and obliging when treated by their superiors with kindness and respect. This class of men is daily decreasing. The turnpike roads have brought the manners of the capital to this extremity of the kingdom. The simplicity of ancient times is gone. Finer clothes, better dwellings, and more expensive viands, are now sought after by all. This change of manners, combined with other circumstances which have taken place within the last forty years, has compelled many a *statesman* to sell his property, and reduced him to the necessity of working as a labourer in those fields, which perhaps he and his ancestors had for many generations cultivated as their own. It is difficult to contemplate this change without regret; but considering the matter on the scale of national utility, it may be questioned whether the agriculture of the county will not be improved, as the landed property of it becomes less divided.

It is painful to one, who has in his composition the smallest spark of knight errantry, to behold the beautiful servant maids of this county toiling in the severe labours of the field. They drive the harrows, or the ploughs, when they are drawn by three or four horses; nay, it is not uncommon to see, sweating at the dung-cart, a girl, whose elegant features, and delicate nicely-proportioned limbs, seemingly but ill accord with such rough employment.

A judgment of the refinement and civilization of a people has been often formed from their treatment of the fair sex, and in this respect France was formerly held up to the world as a model. Unfortunately the manners of nations are too often painted by those who have been

been conversant only with persons in what may be called high life; but were it allowable to apply this rule even to France, and to look for specimens into the lower orders of society, (and it is there surely that the most faithful representatives of national character or manners are to be met with) it would be found that the women, even in the boasted days of her monarchy, were doomed to the severest labour, to load the dung-cart, to saw the wood, and to thresh the corn.

The common people of both sexes wear, especially in the winter season, instead of shoes, *cloggs*, which differ from shoes in this, that the bottom part is made of wood. The wood is generally either birch, alder, or sycamore; it is about an inch in thickness, and a rim of iron is nailed round the bottom of it. A pair of *cloggs* costs 3s. 6d.; they keep the feet warm and dry, and, with good care, will last a twelvemonth.

SECT. 2.—*Rent.*

The rent of the land varies with its situation and fertility. In all situations, and of all qualities, it has encreased greatly in its value within these few years. This may be owing partly to the advance in the price of its productions, and partly to improvements in the art of farming. At Shap, Ambleside, and in Troutbeck, the best hay-meadows are let at about 50s. the customary acre. Near towns the rent of the best fields to be mowed may be, at a medium, rather above 3l. per acre. At Kirkby-Stephen and Appleby they are not quite so valuable. Near Kendal, Burton, and Milthrope, some fields are let at 4l.; and at Kirkby-Lonsdale there are a few which fetch above 5l. Lands of inferior kinds may be hired for pasture at all varieties of price. In Ravenstonedale, where no tithes are paid, and where the land derives no part of its value from its situation, there are between 2000 and 3000 acres

acres inclosed; four fifths of these are let from 4s. to 11s. the statute-acre, and the remaining fifth from 20s. to 40s.

In the bottom of Westmoreland a farm of an hundred acres of inclosed land may be hired upon lease for 150l. A farm containing much coarse pasture-land may be had for 20s. or 24s. per acre. It is not always known whether these coarse pastures have been measured, they being sometimes estimated by the number of cattle they can maintain.

Besides the rent, the farmer is subjected to the payment of tithes, poor rates, and road money

SECT. 3.—*Tithes.*

In some parts of Westmoreland, tithes are taken in kind; in some, each farmer has an opportunity of taking his own tithes; in others, the land is tithe free, or pays a small prescription in lieu of tithes.

SECT. 4.—*Poor Rates.*

From the best information he has been able to collect, the Bishop of Landaff, in the Preliminary Observations, has stated the average of poor rates, not to exceed a shilling in the pound, in the rental of all the lands in the county.

SECT. 5.—*Leases.*

The mode of farming is nearly the same throughout the county; and the course of crops is often pointed out to the farmer in his lease, which is generally for seven or nine years, sometimes only for five or three years, at others for fourteen, and in a few instances for twenty-one years. Some principal land-owners grant no leases.

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SECT. 6.—*Expence and Profit.*

A long and intimate acquaintance with the management of farmers, would be necessary to state any thing with precision, upon this part of the subject. It has been said, that the general oeconomy of a farm of 100 acres, at a rent of as many pounds, does not differ widely from the following statement: 15 acres, under crops of barley and oats, 35 acres in hay, and the remaining 50 acres in pasture; that 10 dairy cows kept on the best of this pasture, might probably yield 20 firkins of butter, and that the profit would be 60*l.* or 23*l.* per cent, upon 260*l.* the capital employed.

CHAPTER V.

IMPLEMENTS.

IT has long been known what angle the sail ought to form with the keel to make the ship move in the water with the greatest velocity; but, to the present day, was reserved the discovery of the angles which the component parts of the plough ought to form with one another, and with the line of draught, in order that that instrument might meet with the least possible resistance in the performance of its operation. Agriculture cannot—but advance with hasty strides, when the principles of philosophy and the powers of mechanism are directed to its improvement.

Ploughs.—The ploughs of Westmoreland are light, and, although

although not neatly constructed, they are perhaps not ill suited to the soil they are destined to cultivate; some of them have a wheel at the extremity of the beam, which, it is imagined, serves to keep the furrow of an equal depth. They are drawn most commonly by two, but sometimes by three horses. The turnwrist plough has been introduced into the county by the Bishop of Landaff, and may be of great service in ploughing the sides of the hills, which are very numerous and steep in the arable lands.

Carts.—The carts are of various descriptions and sizes. Those most commonly used may be fifty-two inches in length, thirty-six in breadth, and fourteen and one half inches in depth, containing less than sixteen cubic feet. They are mounted in some places upon clog-wheels, and have two-thirds of their length before the axle, which is of wood. There is scarcely a farming waggon to be met with in the county; it being a general opinion that four horses in four separate carts will draw a greater weight than if they were yoked together in a waggon.

The winnowing machines, which are here very common, and the harrows, are both of the ordinary kinds. The drill husbandry being yet in its infancy, there are few instruments for hoeing or drilling.

CHAPTER VI.

INCLOSING FENCES—GATES.

EXCEPT a very few open fields on the east side of the river Eden, the whole cultivated land in the county is divided, by hedges or stone walls, into inclosures, many of which

which do not contain half an acre; there are a few of 8 or 10 acres, and in general they may contain from 3 to 5 acres.

The gates are of the most ordinary kind, being often made by the farmer himself, of such wood as happens to be upon the estate.

CHAPTER VII.

ARABLE LAND.

SECT. 1.—*Tillage, Fallowing, Rotation of Crops, and Crops commonly cultivated.*

Course of Crops.

WHEN a field of grass is overgrown with moss, which commonly happens in seven or ten years, it is broken up with the plough in the beginning of March, and sown about the first of April with oats, at the rate of seven and one-half Winchester bushels upon the customary acre of 6,760 square yards. The crop is reaped about the middle of September, and sixty bushels are reckoned a tolerably good return.

Second Crop.—The land is ploughed for the second crop as soon after Candlemas as the weather will permit, and eighty or a hundred cart-loads of stable-yard dung are laid upon the acre. It is ploughed again in April, and sown with four bushels of barley or bigg: The harvest is earlier than that of the oats, and fifty-four bushels are reckoned a good crop. Some farmers plough three times for barley, but it is the general practice that is here described.

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Third Crop.—After the barley the land is ploughed in April, and eight bushels of oats per acre are immediately sown upon it. The harvest is commonly in September, and the crop is usually as good as the first was.

This is the most ordinary succession of crops, though it is sometimes broken through by taking two crops of oats before the barley, which, in that case, is followed by another of oats. The land is then left to itself, and the first year it produces a light crop of hay of bad quality. In the third year the crop is at the best with regard to both quantity and quality. In seven or in ten years it is again mowed over, and is again ploughed up to undergo a similar treatment.

Exceptions.—1st. To this general mode of management there are several exceptions, which perhaps it would be improper to omit. From Kirkby-Steven to Brough and Appleby, and from that town to Temple-Sowerby, the soil is a deep sand, which, by cultivation, becomes more compact, and more retentive of moisture. The fields of grass, mow over sooner or later, according to the quality of the soil; some, where the soil is thinnest, and the subjacent stratum the poorest, it is judged necessary to break up after an interval of only four or six years. In this part of the county there are particular farms, where, after the second crop, which is oats generally inferior to the first, the land is summer fallowed, planted with potatoes, or sown with turnips, which last are given to the wintering stock of cattle and sheep. Dung is always laid upon the fields designed for turnips and potatoes, and the remainder upon the fallow, which is likewise invariably and always successfully limed at the rate of seventy-five Winchester bushels per acre. What is so fallowed is sown, in the middle of September, with two and one-half bushels of rye per acre. The crop is reaped before a year goes round, and thirty bushels are reckoned a good return.

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In the month of May, grass-seeds are sown amongst the rye, but are never covered either by the harrow or the roller. Those fields which were turnips and potatoes are sown with barley or oats, and grass-seeds, in the following quantities to an acre: eight pounds narrow-leaved red clover seed, which is preferred to the common broad-leaved clover, because it remains longer in the ground; four pounds white clover, four pounds hop clover, four pounds of rib-grass, and from five to ten bushels of hay seeds shaken from the crop of the former year. These consist chiefly of *Bent* grass, which seems to be a species of rye-grass, of the great *Poa*, or oat grass, and *Dark* grass, or Flanders hay-seeds. The first year, whether it be hayed or pastured, the crop is far more valuable than that of any natural grass in the neighbourhood upon soil of an equal quality; and the cattle, especially the horses, uniformly prefer these artificial grasses to those which the land produces of its own accord.

Exception 2d.—In the immediate neighbourhood of Kendall, where the soil is gravelly or sandy, it is not unusual to take potatoes for the second crop, and barley for the third; the land is then sometimes left to itself, but for the most part the barley is followed by a crop of oats. A great many potatoes are grown and consumed in the county. The price, at the time of taking them up, is commonly 1s. 4d. per Winchester bushel; in the Winter and Spring it often rises to 2s. The produce is variable, from 250 to 350 Winchester bushels per statute acre. They are cultivated in various ways, but chiefly by the plough. The inhabitants think that potatoes from fresh ground are of the best quality, but the product is usually the greatest from an oat stubble. Sometimes the farmer grows the potatoes at his own risk; at others he manures the land with 100 cart-loads of dung per customary acre, ploughs it once, and lets it in this state at 2s. the perch
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to the manufacturers and labourers of Kendall, who furnish the plants and the rest of the labour. The price they pay is high, but reckoning little for the work they bestow upon it, which is conducive to their health, they are often well satisfied with their crop which is sometimes very great, the land being well adapted for the cultivation of this root.

Exception 3d.—From Millthrope to Burton, and from Burton by Farlton to Kirkby-Lonsdale, both the farms and inclosures appear to be somewhat larger than in most other parts of the county, and it is not quite so rare to see a few acres of wheat. The land designed for this crop is summer-fallowed after the first or second year from the ley, and is well manured with dung or lime, or with both. It is sown in September, with wheat soaked in brine, or washed with chamberlye, and dried with lime, at the rate of four bushels per customary acre. Forty-five bushels are reckoned a good crop; and the harvest may be ten days earlier than it is in the northern parts of the county. If the land is again manured, it is sown with barley after the wheat; if not manured, it is sown with oats.

SECT. 2.—*Crops not commonly cultivated.*

It is painful to be obliged, in this section, to mention pease, beans, turnips, clover, and rye-grass; but it is hoped the time is not far distant, when they will be cultivated on every farm. Cabbages have been tried in the fields near Kendall, and rape has lately been sown in small quantities, in different parts of the county, with great success.

Flax and hemp are now rarely seen growing here, though, 50 years ago, a little hemp was sown by almost every cottager and statesman.

CHAPTER

CHAPTER VIII.

GRASS.

SECT. I.—*Natural Meadows, and Pasture.*

EVERY occupier of land, whether *statesman* or *farmer*, having it in his power to keep any number of cattle, through the months of Summer, upon *joisted* fields where they may be kept at a cheap rate, or upon commons where they may be kept almost for nothing, it is a principal object with him, to provide for them plenty of Winter food. Hence his attention is chiefly directed to his crop of hay. It has been already stated, that the quantity of land, at present under culture, does not exceed one-fourth part of the whole county, or 135,000 acres. Had all the arable land in the county been cropped with corn three years out of twelve, there would have been precisely one-fourth part of the whole in tillage; but there are many pastures of an inferior sort, which are very seldom ploughed, and in the high parts there is a much smaller proportion of the land in corn than there is in the low parts. In the very extensive manor of Ravenstonedale, although there are between 2000 and 3000 acres inclosed, there are not sixty acres of corn; and it is probable that there are not in the county more than 20,000 acres under crops of corn in one year. The remaining 115,000 acres are cut for hay, or depastured with fattening beasts and rising stock, or with cows applied to the purposes of the dairy. From such an inspection of the county as was had with a view to the framing

framing of this Report, the proportions used for these different purposes cannot be even guessed at; but that for hay is perhaps the most considerable. A prejudice against the artificial grasses prevails so generally over all the county, that it may be almost literally said, they are never sown. When the land has produced a few crops of corn, and it is judged that the moss is quite destroyed, it is left to itself; and such is the humidity of the climate, and so strong is the vegetation of weeds and natural grasses, that the very first crop has, by actual experiment, been found to produce 120 stones of hay per acre, weighed from the field. As every person who expects to have occasion for hay, hires a field to supply him with that commodity, it is not often that hay is sold in large quantities; and it is still seldomer that the quantity raised upon an acre is exactly ascertained. When sold, it may bring from 4d. to 6d. a stone in Winter and Spring, or from 4s. to 5s. a cubic yard. A cubic yard in the lower part of a well-pressed mow may contain twelve stones of hay, and has been known to sell as high as 7s. or 8s. In the southern and in the eastern parts of the county, much attention is paid to the making of compost dung-hills, which, with the dung that remains after manuring for the barley crop, are always laid upon the hay grounds, and are thought considerably to retard the progress of the moss. At Kendall and other places, where dung can be purchased, they are manured after the first crop, and every third year while they continue in grass.

SECT. 2.—*Artificial Grasses.*

It was mentioned in the last section of the former chapter, that crops of clover, and rye-grass, had not yet entered into the general course, and therefore nothing can here be said upon this part of the subject, except that they have been tried on several farms, where they

have fully answered the expectations of those who made the experiment. Some hints concerning the advantages of this practice may be seen in the conclusion to this little Work.

SECT. 3.—*Hay Harvest.*

Although this is the principal harvest in most parts of Westmoreland, nothing worthy of notice occurs upon the subject, except, perhaps, the celerity with which the crop is got, it being generally carried into the barn, if the weather is good, within three or four days after being mown.

SECT. 4.—*Feeding.*

Fattening Cattle.—The young cattle are kept on the lands of inferior quality in Summer, and have straw and a little hay given them in Winter. When three years old, if barren, they are either fattened in the pastures, or fold to the graziers of Yorkshire and Lancashire from 5l. to 8l. a piece; if with calf, from 7l. 10s. to 10l.

Ten thousand Scotch cattle are annually sold at Brough-hill fair in the end of September. Though numbers of these are carried off by drovers to the south of England, and many are brought by graziers from other counties, great quantities remain in Westmoreland. They are wintered on the coarse pastures, and in the straw yard; in May following the young ones are sent to the commons; and those of an age proper for feeding are put upon the best grounds, and are ready for the shambles in October.

Heifers are *joisted* upon tolerably good pasture from 10th May to Michaelmas, at from 1l. 1s. to 1l. 7s. a head. Horses are grazed among fattening cattle for 3s. 6d. a week. Young horses are kept from Michaelmas to 5th March

March on the inferior kinds of land, and have straw given them in bad weather for 2s. a week.

Fattening Sheep.—Almost all the sheep in the county, except the wedders after the first year, are brought from the mountains on the approach of Winter, and kept in the inclosed grounds till the month of April. Some graziers stock part of their pastures with wedders, or with ewes and lambs. The mutton and lamb, which remain after supplying the consumption at home, are sent to Lancaster and Liverpool.

CHAPTER IX.

GARDENS AND ORCHARDS.

ALMOST every family in Westmoreland has a small garden for supplying them with the common pot-herbs.

There are several orchards in the county, which are said to be flourishing and profitable. The common fruit trees succeed well in the low and warm vales, but their culture is little attended to.

CHAPTER X.

WOODS AND PLANTATIONS.

AT Whinfield Forest, and at Lowther-hall, the seat of the Right Honourable the Earl of Lonsdale, there are

very extensive plantations, where many of the trees have grown to an uncommon size. Several of the oaks at Lowther-hall, have been valued at sixty pounds a piece. There are many smaller plantations, and various clumps of trees throughout the county, where the wood springs with a degree of vigour, hardly to be expected in such bleak and exposed situations as many of them are planted in.

On the division of Kendall common, part of a very high and rocky hill, not being capable of any other improvement, was planted with Scotch fir, larch, oak, ash, &c. &c. all of which are very thriving.

The banks of the lakes are likewise adorned with very beautiful coppices.

The Bishop of Landaff has planted, on some high ground near Ambleside, above an hundred acres with oak, ash, elm, beech, sycamore, Scotch fir, and larch. He is doubtful whether the climate be not too cold for any sort of wood, except the fir and larch; the other kinds, after seven years growth, are alive, but stunted; they shoot a little in the Spring, but that shoot perishes, as to its greatest part, in the Winter. Some of them have been cut down, but the new shoots do not promise well. The firs and larches, but especially the larches, thrive as well as he could wish.

CHAPTER XI.

WASTES.

THE Wastes in this county are very extensive and valuable. They are depastured chiefly with stocks of sheep,

sheep, which are managed in nearly the same way, whether the ground be in common, or in severalty.

In Winter, all the sheep are brought down to the inclosed fields, except the wedders, which, being thought able to endure the severity of any storm or fall of snow, are left to shift for themselves upon the wastes, where they remain till they are four years and a half old, when they are sold from 9s. to 13s. a head. Having dropped their lambs, the ewes, in the end of April, are sent back to the wastes, where the whole flock pastures indiscriminately without an attendant. The lambs are sometimes suffered to wean themselves; at others, the teats of the ewe are fastened up to her udder by a plaister of coarse paper and pitch. The value of the wool, and the expence of salving, are the same with those mentioned, sect. 2.—chap. 13.

Scotch Sheep.—Great numbers of Scotch hogs and dimonds are annually bought at Stagshawbank fair in the month of June, and grazed on the wastes of this county. On some they are found to answer very badly; on others they thrive well, and are ready for the grazier a year earlier than those of the native breed. There is here a strong prejudice in favour of these coarse-woolled sheep, which there is every reason to believe is ill founded, the sort now known under the name of the *Cheviot* breed being equally hardy, and much more profitable from the superior value of their fleece.

Black Cattle.—In addition to all these sheep, numerous herds of black cattle are likewise to be seen upon the commons. A few of these are of the breed of the county, and the rest are Scotch, either bought at Brough-hill fair in the end of September, and wintered on the low grounds and in the straw-yard, or purchased in the Spring from drovers, who fetch them from Galloway and Dumbarton. In Autumn, they are either sold to the

South-country drovers, or wintered and fattened in the county.

Ponies.—A few ponies of the Scotch breed are reared upon the commons; but the practice not being general, it need not be dilated upon.

Geese.—Great numbers of geese are bred upon the commons, and sold to the Yorkshire drovers at about 1s. 4d. a head.

It is generally understood that no person shall send to graze on any common more stock than he can winter upon his estate or farm, in right of which he has a title to pasturage on that common. This regulation, however, is little attended to, and the commons are almost always overstocked to such a degree, that many persons do not think it worth while to avail themselves of their right of commonage.

On stinted pastures, it is very ordinary to hire out the right of keeping both cattle and sheep. A Summer's grass for an ox, or for ten sheep, on Forest Hall, and Mosley common, is let at 4s.; on a part of Troutbeck common, where no sheep are allowed to feed, an ox may be kept for 3s. 6d. and on another part of the same common, *an ox or ten sheep may remain all the year for sixpence.*

CHAPTER XII.

IMPROVEMENTS.

SECT. 1.—*Draining.*

THE importance of having the land lie dry, and of preventing the water, which, in wet weather, breaks out upon the declivities of the hills, from chilling the fields below, is well known in Westmoreland. The method of draining is fast improving, and the practice is daily gaining ground. The drains are generally walled in the sides, and covered with large stones out of the reach of the plough.

SECT. 2.—*Paring and Burning.*

The operation of paring and burning is much practised in Westmoreland, both in improving moor lands, and in reclaiming rough pastures, that have been allowed to return almost to a state of nature. It produces excellent crops at first, but the effect is diminished every repetition, and farmers are too apt to exhaust the land by repeated crops of oats without any manure.

The expence is said to be from 15s. to 20s. per statute acre.

SECT. 3.—*Manuring.*

Dung.—To increase the quantity of his manure, and to apply it to the greatest advantage, are by no means the least important of the various branches of the farmer's

mer's avocation. In those parts of Westmoreland where summer-fallowing is not practised, the land designed for barley and potatoes always receives the stable-yard dung at the rate of 60, 80, or 100 single-horse cart-loads an acre; and in Autumn, what remains is laid upon the hay-grounds, at a rate per acre considerably less.

On some few farms in the neighbourhood of Appleby, where summer-fallow and crops of turnips may almost be said to enter into the general course, the dung is carried in Winter from the yard to the fields, and laid down in a heap, which is turned over two or three times, with a view to accelerate putrefaction. Twenty cart-loads per acre are laid upon the turnip land and the fallow, and its operation is always assisted by the addition of seventy-five Winchester bushels of lime. Dung is sold at Kendall and at Mithrope for 1s. a cart load.

Lime.—In most parts of Westmoreland, limestone is found in inexhaustible plenty; but coals to burn it must be carried from such a distance, that its application to the purposes of agriculture has not yet become general. When, by the projected canal to Kendall, coals shall be brought into the heart of the county, its use must soon become universal.

It is sometimes laid upon the land when it is in tillage, but for the most part it is spread upon the surface of grass fields; and it has been found to sweeten such as are coarse and benty amazingly.

In whatever way it is applied, and in whatever quantity, varying from 75 to 480 Winchester bushels an acre, it is always attended with wonderful effect. The price at the kilns is 3d. or 4d. a bushel.

Composts.—Much attention is paid to the making of compost dung-hills in many parts of Westmoreland. They are most commonly spread upon grass, and experience has shewn, that they at once improve its quality, and
check

check for years the progress of the moss. One hundred cart-loads of earth, rakings of the roads, mud, or rotten leaves, and fifty of dung, carefully mixed with 300 Winchester bushels of lime, are laid upon three acres with great advantage.

Marl.—This valuable manure was scarcely known in Westmoreland, till about three years ago, when a species of rock marl was discovered on Bolton Common. It is easily come at, and has been applied with advantage, upon a small scale, at the rate of 80 single-horse cart-loads to an acre. It is more than probable that, if properly sought for, *shell marl* might be got in many of the low grounds and marshes, with which Westmoreland abounds.

SECT. 4.—Weeding.

The weeding of turnips and potatoes, is practised in Westmoreland; but the hoeing of turnips is in general so ill executed, that a gentleman of fortune in the county has recommended to the Board of Agriculture, to send some turnip-hoers from those districts, where this simple operation is better understood.

The larger weeds are taken out from amongst the growing corn; but it is very seldom that docks, rag-weeds, &c. &c. are destroyed on the meadows and pastures.

SECT. 5.—Watering.

The fertility attending the overflowing of the Nile, and other muddy rivers, has been long known and well explained, from their depositing the earthy, oleaginous, saline, putrescent ingredients, with which, in their course from the mountains, they become impregnated; but it is a late discovery in philosophy which teaches us, that pure water

water is itself compounded of two principles, and that one of its component parts is, by the process of vegetation, converted into the substance of vegetables. This discovery enables us to account for the utility of irrigating land, even with the clearest water, which long experience has shewn to be a most efficacious mode of improvement.

Those who have opportunities of applying water, and are not conversant in the practice, would do well to imitate the example of the Bishop of Landaff, who is making great improvements by watering, at Calgarth Park. It is practised on a small scale in many other parts of Westmoreland, and always with great success.

CHAPTER XIII.

"LIVE STOCK"

SECT. 1.—*Cattle.*

THE attention that was formerly paid to the breed of black cattle has rather diminished of late years. They are long-horned, very much resemble the Lancashire breed, and, when kept to a proper age, grow to a great size. As a heifer of three years old can be sold for as much as an ox would fetch at four, it is rare to see a bullock of the country breed; but to judge from those of all ages in the pastures at Lowther-hall, they are excellent feeders, and possess, in an eminent degree, the very desirable property of laying the fat upon their backs and other valuable parts. The heifers and barren cows,

if

if well chosen, are confessedly good thrivers, and are in great request among the graziers of Yorkshire and Lancashire. Not many years ago there was killed, at Lowther-hall, a bullock of the country breed, whose carcase weighed one hundred and thirty-two stones.

Dairy.—There are few counties in England, in which there is no great manufacturing town, where more milch cows are kept in proportion to its size, and where the produce of the dairy forms a greater part of the profits of the farmer. It may be naturally supposed that he is particular in the choice of his cows, and that they are remarkable for giving a great quantity of milk. Neither supposition, however, is founded in truth. The farmer keeps just such cows as he has bred, and they by no means yield so much milk as would be expected from those of the Dutch, or even the Scotch breed,* upon a pasture of the same quality. Farmers in the country generally estimate the expence of keeping a milch cow at five pounds a-year, and the produce at eight pounds. Cows in the country are kept for the sake of making butter, of which great quantities, of an excellent quality, are sent yearly to the London market in firkins of 56 lbs net, at from 30s. to 35s. each. In the immediate neighbourhood of Kendal, the dairy turns out to better account by selling the new milk, which is contracted for all the year at 1½d. a quart, being the same price which the London cow-keepers receive. The skimmed milk is sold at one third part of that rate. The ordinary price of a good milch cow may be about ten pounds.

* The Ayrshire breed is reckoned the best for milch cows in Scotland, particularly in the neighbourhood of Dunlop. The comparative value of all the different breeds, in regard to quantity of milk, &c. the Board of Agriculture proposes to ascertain.

SECT. 2.—*Sheep.*

The breed of sheep, kept on the mountains and commons of Westmoreland, is either native or a cross with Scotch rams. No attempt has yet been made to improve either the carcase or the fleece. They are horned, dark or grey faced, thick pelted, with coarse, strong, hairy wool. The whole flock upon a farm is herded together, which is different from the practice in those counties where sheep farming is thought to be the best understood.

Wintering.—Those store-masters who have not upon their own farms pastures sufficient for the wintering of their young sheep, send them to the low grounds from the 1st November to 6th April, and pay 2s. a-head for those that return. They are so subject to the *Black water* (*Sickness, or Middling-ill*) that, at an average, ten out of an hundred die before Christmas. After that, being very hardy, they seldom die, and never of that disease.

Price.—The wedders are sold in October, when four years and a half old, from 9s. to 13s. each; the barren ewes at Lammas, from 8s. to 10s.; and the old ewes about 6s. to be wintered in the inclosed grounds, and fattened with their lambs the ensuing Summer.

Salving.—In October, or the beginning of November, the whole flock is salved so heavily, that a gallon of tar and 16 lbs. of butter are expended upon thirty-five sheep. A man may be hired for this work at 1s. 8d. a-day, in which time he will not salve above ten or a dozen; or he will undertake to salve them at 2d. a-head. The whole expence is about sixpence a-piece. It has been repeatedly tried to substitute tobacco-liquor for the butter and tar, but it is generally imagined that the wool is better for the sheep having been salved. Near Kirkby Steven, this operation

operation is performed with oil and tallow, at an expence of 4d. a head.

Wool.—The wool is worth, on an average of years in time of peace, 5d. a pound. Part of it is sold to the manufacturers of Kendall, and part of it to those at Bradford, and other places in Yorkshire. The ewes are said to bear the best wool; and on an average of a flock six fleeces weigh a stone.

Silverdale Breed.—Silverdale, a small district in the neighbourhood of Millthrope, gives its name to the breed of sheep in this part of the county. The soil is good, and on a limestone stratum, and a branch of the sea is nearly contiguous to it. They are horned, white faced, and close woollen. They are said to be native, and are much superior to the common sort, in regard both to fleece and carcase. At the sale of a farmer's stock, in October 1793, the lambs of this breed brought 10s. 7d. a-piece, the dinmonds 17s. 1d. and the ewes at the age of three years and a half, 17s. 6d. or 17s. 8d. In the townships of Burton and Holme, where this breed is kept, five sheep at an average yield a stone of wool, which is worth 8d. a pound. At a medium of the whole parish of Burton for eight years, from 1772 to 1779 inclusive, it required six fleeces to weigh a stone.

It is not unusual for the proprietor to be owner of the sheep upon the farm. In this case the farmer is to be considered as little better than a shepherd. The flock is valued at the time of his entry, and again at his removal, and the difference between these valuations is settled in money.

Experiments.—1st, Twenty Lincolnshire *Mugg* ewes, that had been tupped by a ram of Mr Bakewell's breed, were brought into Westmoreland in the month of December 1789, and lambed in February 1790. These *Mugg* ewes were tupped in 1790 by a common Westmoreland

land ram, and the dinmonds produced by this cross have turned out the best sheep in the county, and weigh from 18 lbs. to 20 lbs. a quarter, and are thought to be superior to those of the first breed.

2d. Six of the lambs produced from the tup of Mr Bakewell's breed and the *Mugg* ewes, were rams. Four of these rams were put to ewes of the common breed in the county, and the lambs sprung from this cross are much of the same size as the ordinary breed; but they are broader on the back, and finer in the wool. As the experiment has not yet been long tried, it must be left to time to show what the result will be.

3d. The lambs produced by the Lincolnshire ewes, and their own lambs of February 1790, are not so strong as these lambs of 1790, which the shepherd is disposed to attribute to a scarcity of food in the Spring, rather than to any defect in the breed.

4th. Thirty of this breed were left unsalved in 1791; they were in good condition, and had no scab. These same were again left unsalved in 1792, and broke out in scab early in 1793. It must be remarked, that the sheep at the time of salving in 1792 were not in such condition as in 1791; so that it does not appear, from this experiment, that there is any necessity for salving sheep in good condition.

5th. The Lincolnshire ewes do not carry so much wool, nor is it of such a good quality, as when they were brought into the county.

SECT. 3.—Horses.

As there is but a small portion of the county under crop, the horses are not numerous, nor has any considerable attempt been made to improve the breed of these useful animals. They are small, not exceeding fourteen hands and a half in height, are said to be hardy, but they
are

are neither strong nor handsome; sixteen or seventeen pounds are reckoned a good price for a horse at five years old. Most commonly two, tho' sometimes three, and in the western part of the county even four, are yoked together in a plough. They are often turned upon the commons in the intervals of labour, which, as the farmer very probably has neither turnips nor fallow, are very frequent in the summer months.

There being only one person in Westmoreland who uses ox teams, it may be justly inferred, that the general opinion of farmers in the county is in favour of horses. The writer of this Report has not such information upon the subject, as to be able to draw the desired comparison between these useful animals.

SECT. 4.—Hags.

The swine of Westmoreland, though not large, are good in their kind. Farmers, butchers, and others, who kill swine, often dispose of the hams to persons who make a trade of curing them for sale. Perhaps there may not be any thing peculiar in the mode of making hams in this county: but it is believed that a detail of the process may be entered here without impropriety.

The hams are first rubbed very hard, generally with bay-salt; by some they are covered close up, by others they are left on a stone bench to allow the brine to run off. At the end of five days they are again rubbed as hard as they were at first, with salt of the same sort, mixed with rather more than an ounce of saltpetre to a ham. Having lain about a week, either on a stone-bench, or in hogheads amongst the brine, they are hung up by some in the chimney amidst the smoke, whether of peats or coals; by others, in places where no smoke ever reaches them. If not sold sooner, they are suffered to remain

there till the weather becomes warm. They are packed in hogsheds with straw or oat-meal seeds, and sent to London, Lancaster, and Liverpool, in such quantities as to form one of the principal branches of export from the county.

In 1792, neat hams of 16 or 18 lbs. weight were sold as high as 5½d. per pound when green; when cured, in 1793, they were sold at 7½d. a-pound. It has been found by experiment that hams lose twenty per cent. of their weight in the curing.

SECT. 5.—*Rabbits.*

A few rabbits are kept in the neighbourhood of Brough and Orton, and there is a small warren in Ravenstonedale, but it is rare to see them in any other part of Westmoreland.

SECT. 6.—*Poultry.*

Considerable quantities of geese, ducks, and common dunghill fowls are reared in Westmoreland. The two last are generally disposed of in the market towns in the county, or carried to Lancaster; but great numbers of the first are sold to drovers from Yorkshire.

Turkeys are seldom reared here, except in the farmyards of men of fortune.

SECT. 7.—*Pigeons.*

The few pigeons that are to be seen in Westmoreland belong generally to men of fortune. When sold, they often bring 6d. a-piece.

SECT.

SECT. 8.—*Bees.*

Bees are common in Westmoreland, but there is nothing worthy of remark in the way in which they are managed.

CHAPTER XIV.

RURAL OECONOMY.

SECT. 1.—*Labour, Servants, Labourers, Hours of Labour.*

LABOUR is dearer in Westmoreland than it is in almost any of the counties either to the north or south of it. This probably is owing to the great number of small landholders, or *statesmen* above-mentioned, who doing the work upon their own estates, with their own hands and those of their families, are perhaps disinclined to labour for other people.

Servants by the year.—A hind may be hired by the year at twenty pounds, a house, a garden, and a patch of ground to grow potatoes; and an unmarried man at from ten to twelve guineas a-year, and board and washing.

By the day.—The wages of an ordinary labourer are from 1s. 4d. to 1s. 8d. a-day; he begins to work between six and seven, rests an hour at dinner, and leaves it off between six and seven in the evening.—The labourers on the highway from Shap to Kendall receive

1s. 9d. a day for nine months in the year, and 1s. 6d. a-day for the other three months.

By the month.—On the large farms, in the seasons of hay and harvest, it is not unusual to hire labourers by the month of four weeks, at the rate of 1l. 12s. 6d. and victuals. They breakfast on milk-pottage, and bread and cheese, receive a pint of good beer in the forenoon, and another in the afternoon; they dine on meat boiled, baked, or roasted, and potatoes or pudding; sup on cold meat, and have plenty of common beer to drink through the day. They begin in the morning as soon as the corn is dry, rest none but while at meals, and continue as late as they can see to work. Four men may cut, tie, and stook a customary acre in a day, leaving a stubble from nine to fourteen inches in length.

Cutting of corn per acre.—When done by the piece, the cutting of an acre by the sickle, the scythe not being used in the reaping of any sort of grain, may cost 9s. and if the crop be very heavy, 10s. or even 10s. 6d.

Cutting of hay per acre.—The price of mowing a customary acre of grass varies from 2s. 6d. to 3s. 6d. and a man usually mows an acre in a day.

Per. day.—When hired by the day, a mower's wages may vary from 1s. 4d. to 1s. 10d. and victuals.

Mason's wages.—Masons in summer have from 2s. 2d. to 2s. 6d. a-day, or 1s. 2d. or 1s. 6d. and victuals; and in winter 4d. or 6d. less. At Millthrope a few are hired all the year at 1s. 10d. a-day, wet or dry. When they do their work by the piece, and furnish every thing, they are paid 2s. or 2s. 6d. a square yard for a wall of two feet in thickness built with lime; if materials are furnished to their hand, they are paid 8d. or 10d. a-yard. Seven yards and a half in length of a dry stone wall, five feet and a half in height, cost 1s. 6d. or 1s. 8d. in building.

Carpenter's

Carpenter's wages.—The wages of a carpenter or common country wright, differ very little from those of a mason.

Thresher.—A farmer's own servants generally thresh out the corn. When persons are hired for this purpose, they receive about 1s. for threshing a load of seven and a half bushels of oats, and 1s. 3d. for that of barley; and from 4d. to 8d. a boll of rye, consisting of two Winchester bushels.

Miller.—Farmers commonly have their meal made from oats of their own growing. The miller receives 4d. a-load for drying the oats. If they are good in quality, a load of seven and a half bushels will yield 176 pounds of meal, besides paying the miller his toll for grinding, which is guessed to be about four per cent. Wheat is made into flour for 4d. a-bushel. Numberless streams rendering the precarious assistance of windmills unnecessary, there is but one in the county, and it is employed in grinding bark for the tanners at Kendall.

Thatcher.—A thatcher receives about 1s. 4d. a-day and victuals, or 2s. 4d. without victuals.

Slater.—Slating is measured by the rood of forty-two and one-fourth square yards, and costs in the workmanship 12s. or 13s. a rood: In the vicinity of the slate quarries, the slater will find all materials and labour for 45s. or 50s. a-rood.

Tailor.—A tailor gets in some places 10d; in others 1s. a-day and board.

Mole-catcher.—The mole-hills are carefully spread in most parts of the county, and the fields are cleared of moles at the rate of 3d. an acre where they have not been caught before; 2d. an acre are paid the second year, and a penny or three half-pence yearly thereafter.

Maid-servants by the year.—In some farmers' families, where they are hard worked, maid-servants receive 6l. a-

year. Their ordinary wages in other families maybe about 4l. 10s. or perhaps 5l. When they do not change their service, if strangers in the parish, care is taken to vary their wages every six months, to prevent them from acquiring a settlement, to which they would be entitled were they hired for a-year, or were their wages to continue the same for that period.

By the month.—In hay-time and harvest, when hired for a month, they get from 16s. to 24s. and board.

By the day.—When hired by the day in harvest and hay-time, they receive 8d. or 10d. and victuals, or 1s. 3d. or 1s. 6d. without victuals. At other seasons they are paid with 8d. 10d. or 1s. a-day. Their times of entry, and of leaving off work, their hours of labour and of rest, are very various.

SECT. 2.—*Provisions.*

It is not unusual to hear people exclaim against the encrease of luxury, and the alteration that has taken place in the mode of living in their time. The labourer lives as well now as the farmer did forty or fifty years ago; the farmer as well as the man of small landed property; and so on: And is this in any respect to be regretted, or is it not much better for them all? But persons generally cry out most loudly against the rank immediately beneath them, without recollecting that their own mode has been changed in nearly the same proportion as the one which they are so ready to condemn.*

Fifty years ago the price of butcher-meat at Martinmas was from 1½d. to 2d. a pound in Burton market, and eighty beasts were sometimes slaughtered in a day, and bought to be salted for winter provisions. From that time, except a few at Christmas and at Easter, no cattle were killed

* Spencer's Travels,

there till they were fattened upon the pastures in summer. Farmers, in those days, seldom eat any butcher-meat; they lived on bread and butter, and what other little matters the farm afforded. Now labourers generally breakfast on that very ancient food pottage, with the help of a little cheese and bread; they dine on butcher-meat and potatoes, or pudding; and sup on potatoes, or pottage, or bread and cheese.

The bread generally eaten in the county is made from oat-meal. Water and oat-meal are kneaded together into a paste without any leaven; this paste is rolled into a circular cake of about twenty inches in diameter, and is placed upon a thin flat plate of iron, called a *girdle*, under which a fire is put, and the cake thus baked goes by the name of *clap-bread*, and is to be seen at almost every table in the county. This very particular description of baking cakes may appear too minute, or altogether unnecessary, and it owes its place here to the request of some persons of rank who wished to see it recorded somewhere. The meal is mostly ground to such a degree of fineness that a measure of sixteen quarts will weigh sixteen pounds. Farmers, labourers, and manufacturers usually have fifteen cakes made from sixteen pounds of meal, and as many baked in a day as will serve their families for a month. Such of the gentry as eat this sort of bread, most of them now eating bread made from wheat, have it baked much more frequently, and also much thinner. A labouring man will eat sixteen pounds of meal made into bread in a fortnight; the price of sixteen pounds of meal is variable from 1s. 6d. to 2s. 6d.; the medium is 2s. which gives 1s. a-week for each labourer for bread; his cottage and his fuel cost at least as much more. His wages for three-quarters of a-year are 9s. a-week, and 8s. a-week for the other quarter; but making allowance for broken days, 8s. a-week may be considered as the full amount of

the price of his labour; and indeed a good labourer may be hired by the year at that rate. Hence there will remain 6s. a-week for the labour of the man, for the remainder of his own sustenance, the sustenance of his family, and the cloathing of them all.

The difference in the price of provisions in a county so small as Westmoreland, cannot be very great. They are, however, somewhat cheaper in the north and east parts than they are in the south parts, which are more within the reach of the markets of Lancaster and Liverpool. Beef in Kendall market, in the month of October 1793, was sold at 3d. or 4d. a-pound, and a choice cut at 4½d.; in spring it often rises to 6d. a-pound. Mutton, which in spring often rises to 7d. a-pound, was sold at 3d. 3½d. or 4d. Pork was sold at 3d. or 4d. As all the bull calves are carried to market, veal is for the most part cheaper than the other kinds of butcher meat, and yet in spring it is sometimes sold as high as 5d. a-pound. Potatoes brought 1s. 4d. a bushel, or 5s. 6d. or 6s. a-load; in spring they are often sold at nearly the double of these prices. Oat-meal is bought in some places by a measure of sixteen quarts, at a price which fluctuates from 1s. 4d. to 2s. 6d.; in others by a peck of 20 quarts, which in summer 1793 was worth 3s. Butter was sold from 7d. to 9d. a-pound; in winter the price seldom rises above 11d.; a stone of 16lbs. of 20 ounces, costs 11s. 6d. and a firkin of 56lbs. neat, from 30s. to 35s. Cheese in the country costs 3d. a pound, and new milk 1d. a-quart, which in Kendall is contracted for all the year at 1½d.

A turkey costs 3s. 4d. or 5s. according to its size; a goose 1s. 6d. or 2s. or when sold by weight 3d. a-pound; a hen from 7d. to 10d. and a chicken from 4d. to 8d. Eggs fluctuate in their price from 2½d. to 6d. or even to 9d. a-dozen. Ducks are sold from 1s. 4d. to 2s. a-pair,
teal

teal at 4d. a-piece, woodcocks at 4s. or 5s. a-brace, and pigeons from 4s. to 6s. a-dozen.

Salmon caught in the Lune is sold from 4d. to 8d. a-pound; that which is brought from Carlisle from 3d. to 1s. 2d. Char are sold at about 7s. a-dozen, trouts at 4d. a-pound, mussels at 2d. or 3d. a-quart, flounders from 1d. to 6d. a-piece, eels at 2d. a-pound, and rabbits, without the skins, at 1s. the pair. Honey in the comb costs 1s. a-pound.

SECT. 3.—*Fuel.*

The eastern parts of the county are supplied with coal from Stainmore, Blackburn, and Ingleton, in Yorkshire, but in other parts the most common fuel is peat.

It is a question deserving the consideration of the Legislature, whether the duty of coal, carried coastwise, might not in certain districts be taken off, with great advantage to the state. The value of the improvements in agriculture and manufactures which would attend such a measure, in counties ill supplied with fuel, cannot be estimated, but it is presumed that it would very far exceed the loss sustained by the removal.

CHAPTER XV.

POLITICAL OECONOMY, AS CONNECTED WITH, OR AFFECTING AGRICULTURE.

SECT. 1.—*Roads.*

THE great roads leading through the county are kept in excellent repair by the sums collected at the turnpike gates,

gates, and when these prove insufficient, by a portion of the labour of the parish, or of the pound-rate, which may be levied in its aid.

The parochial roads are made and kept in repair by six days labour of the parish, and by a rate not exceeding sixpence in the pound, which the surveyors may levy with the consent of the quarter-sessions; some of these are tolerably good, and others are annually improving. Many of them scarcely exceed the smallest legal breadth allowed by statute, which is eight feet.

SECT. 2.—*Canals.*

There is not at present any canal in the county; but one of great magnitude has been projected from Wigan to Kendall. It is now executing, and when finished, by introducing the coal of Lancashire into the heart of Westmoreland, will be of the greatest service to its manufactures and agriculture. If the coal can be afforded by the proprietors of the canal, at a cheap rate, the town of Kendall may then emulate, in the cloth manufacture, Leeds itself. Another canal, from the bottom of Windermere water to the sea, a distance of about 4 miles, is wanted; if this should ever be cut, the town of Ambleside would rise to considerable importance; it would then be as well, or better situated for trade, than Kendall is now.

SECT. 3.—*Fairs.*

There is a great fair for cattle, horses, &c. at Brough-hill, on the 30th September;—there is a fair at Ambleside on the Wednesday after Whitsunday, and on the 29th of October,—at Appleby on Whitsun Eve, Whitsun Monday, 2d Wednesday of June, and 21 August,—at Kendall, April 27, and November 8 and 9,—at Kirkby Lonsdale, on Holy Thursday, and 21 December,—at Kirkby-Stephen,

Stephen, on the Monday before the 20th March, October 2d, 27th, and 29th,—at Millthrope on 12th May,—at Shap, on the 4th May,—at Orton, on the 2d May, the Friday before Whitsunday, and second Friday after Michaelmas,—and at Old Town, on the 5th and 6th October.

SECT. 4.—*Weekly Markets.*

There are weekly markets at eight different towns in Westmoreland; but the only one of any note, is held at Kendal. The next in point of consequence is held at Appleby, the county town.

SECT. 5.—*Commerce.*

The commerce of Westmoreland is not yet so extensive as to have any sensible effect upon its agriculture: Its exports are coarse woollen cloth, manufactured at Kendal, stockings, flates, tanned hides, gunpowder, hoops, charcoal, hams, wool, sheep, and cattle. Its imports are chiefly merchant goods, wheat, oats, with a little barley, cattle and sheep.

Millthrope is a very trifling port, and the only one in the county.

SECT. 6.—*Manufactures.*

The manufactures of Westmoreland are not of much greater importance than its commerce. They consist chiefly of coarse woollen cloth, called *Kendall Cottons*, properly, it is said *coatings*, gunpowder, stockings, silk and worsted, waistcoat pieces, flannels, and tanned leather.

Most beautiful stockings, and carpets of strength and lustre, little inferior to those of Persia, are manufactured at Lowther for behoof of the Earl of Lonsdale. A few of these have been sold from 63l. to 105l.; but as they are wrought

wrought solely for his own use, or to be given in presents to his friends, perhaps they do not enter with propriety into an enumeration of the manufactures of the county. What is now the manufactory, was originally a college, but, being only in its probationary state, was discontinued by the late Lord Viscount Lonsdale. The Earl of Selkirk, and the late Duke of Athol, were educated here; and an ash-tree, planted by his Lordship, is still pointed out.

SECT. 7.—*Poor.*

Westmoreland not being a manufacturing county, and landed property being there, in general, minutely divided, the number of poor who apply for parochial aid, is comparatively small. The poor rates in the parish of Kendall are 3s. 8d. in the pound of the actual rent, which is very near four times the average of the rate throughout the county. Were it not unfair to draw a general conclusion from one example, it might be inferred that the poor are most numerous in manufacturing counties and towns.

SECT. 8.—*Population.*

The inhabitants of Kendall were found, by an actual enumeration in 1793, to amount to 8089, and the whole population of the county has been estimated at 35 or 36 thousand. As the number of births considerably exceeds the number of burials, many of the inhabitants must migrate to other counties.

CHAPTER

CHAPTER XVI.

OBSTACLES TO IMPROVEMENT.

THE most material of these are customary tenures, where the fines are arbitrary, or according to the improved value of the estate, where the wood is the property of the lord, and where a lease for longer than three years is not valid without his consent; want of leases, or very short leases, and the collection of the tithes in kind.

CHAPTER XVII.

MISCELLANEOUS OBSERVATIONS.

SECT. I.—*Weights and Measures.*

GREAT diversity of weights and measures prevails in Westmoreland, as is the case in almost every county in Great Britain. The pound consists of 12, 16, 18, or 24 ounces, and the stone of 14, 16, or 20 pounds. There is a Winchester bushel, a customary bushel equal to three of these, a bushel of two bushels for the sale of potatoes near Appleby, and one of two and a half for that of barley. Rye is sold by the boll of two bushels, and potatoes by the load of four bushels and a half heaped, or more generally

erally a bag which holds seven and one half bushels is filled and sold for a load of potatoes.

There is the statute acre of 4840 square yards, the customary acre of 6760 raised from the perch of six and one half yards, and a third acre on the borders of Lancashire, raised from the perch of seven yards, containing 7840, being the same as the Irish plantation acre.

SECT. 2.—*Supply of London.*

London is not much indebted to this county for its articles of consumption. The little it receives from hence consists chiefly of butter, bacon, hams, and excellent blue flates, which form a cover for some of the best houses in the capital. It is probable that, after being fattened in the southern counties, some of its cattle and sheep reach Smithfield market.

CONCLUSION.

Means of Improvement, and the Measures calculated for that purpose.

SECT. 1.—*Arable Lands.*

CLOVER. In many counties of England the land is sown with grass seeds, and left to lie for some years with a view to refresh and enable it to bear crops of corn; but in Westmoreland it is ploughed and sown with corn in order to prepare it for grass. When it hath been cropped for three years, and it is judged that the soil is sufficient-
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ly reduced, and that the moss is quite destroyed, the land is left to itself to grafs over. The first crop of hay is never either weighty or good in quality; the second is generally very superior in both these respects to the first, and so favourable are the climate and the soil to the growth of grafs, that the third crop is often so abundant as to be let for two or three pounds per acre, and of a quality so excellent, that in several places cattle are fattened upon it in Winter for the markets of Lancaster and Liverpool. But even these best crops are far inferior in point of value to those that would be produced by the same fields, were their natural aptitude to grow grafs directed to the production of clover and rye-grafs. The prejudice that prevails almost universally in Westmoreland against these artificial plants is a great obstacle to the improvement of the husbandry of the county, and must be overcome before the arable lands can be brought to that degree of cultivation of which they are susceptible.

It is said that hay made of clover and rye-grafs is much coarser than that which is made of the natural grasses; and that these artificial plants giving place to the natural ones, perish at the end of two or three years, and therefore ought never to be sown at all.

The opinion is conceived to be ill founded which holds that hay made of sown grasses is bad in quality; long experience and continued practice having shown that horses are very fond of such hay, and that when even fed upon it alone they are able to do a great deal of hard work. It can hardly be seriously asserted that hay made of the trash produced spontaneously by the land the two first years after it has been cropped with corn is better than hay made of clover and rye-grafs. The artificial grasses seldom or never perish at once at the end of either the second or third year: they disappear gradually, making room for the natural herbage to occupy their place, which

it is imagined it would be found upon trial to do with much more profit to the farmer than would have accrued to him by managing his lands in the ordinary way; for the superior value of the hay the first two years would far more than reimburse him for the expence of the grass seeds, and he might still have his favourite natural hay after these had died entirely out.

This is stated upon the supposition that the field was to be allowed to lie eight or ten years in grass, as is the custom at present. If it were to be broken up at the end of the first or second year, it would be found in good condition for bearing a crop of corn, the roots of clover, it is well known, being a great improver of the soil: but this way of cropping the lands will enter with more propriety into that part where an alteration of the present course will be suggested.

In the year 1792, Mr Smith at Henridding in the parish of Burton, sowed a close containing exactly two acres and a half Lancashire measure, with 48 lbs. of red clover seed amongst a crop of barley, for which the land had been slightly manured after fallow wheat. This field is in Lancashire, but being situated within an hundred yards of the county of Westmoreland, it may be mentioned here without impropriety, and it is selected merely because the particulars respecting it are better known to the writer of this Report than those in regard to any field of clover in the county that was the object of his survey. It was mown in the month of July 1793, and it then yielded a crop of twenty-two single-horse cart-loads of hay. It was mown a second time in September, and produced eighteen of the same cart-loads. It was depastured with nine sheep from the time the last crop was carried off till the beginning of November, and the foggage was then tolerably good. Let the most strenuous advocates for natural grass, say whether they ever had a crop so valuable!

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Where the land is intended to be depastured, the argument will apply with treble force; and the decided preference given by cattle of all kinds to the green herbage of the artificial, over that of the natural grass, ought to remove every doubt from the minds even of those who are the most strongly prepossessed in favour of the present practice.

In front of Carus Willson, Esq.'s new house near Kirkby Lonsdale, there lies a field of sixteen acres, which was sown with grass seeds amongst a crop of barley in the year 1792. It was depastured in 1793, and maintained *three times* more stock than he would have expected it to maintain, had it been left to itself in the ordinary way. Farmers, the most prejudiced against sown grasses, saw and confessed the force of the experiment; and, it is not to be doubted, will follow an example which tends so materially to promote their interest.

The cultivation of clover is perhaps the greatest improvement in the art of farming which has been discovered in modern times; and it is equally matter of regret and of surprise, that what is at once so easy and so profitable is not yet become universal, and it furnishes a strong instance of the difficulty with which old habits and prejudices are rooted out, even when self-interest is concerned in their extirpation.

Turnips.—The climate and soil of the vallies of Westmoreland are well suited to the cultivation of turnips, which must be carried on to a considerable extent before the agriculture of the county can be improved in any material degree. Experience has shown that this crop, and the mode of husbandry usually connected with it, are able, not only to fertilise particular farms, but even to improve whole counties. The most profitable and the least troublesome way of disposing of this crop is to fatten sheep with it. A customary acre of turnips, if the crop

is good, will feed twenty-five sheep weighing sixteen pounds a quarter, from 1st November to 1st April; even supposing the sheep made no advance in these five months, the very encrease of the price of the mutton from 4d. to 5½d. or 6d. a pound, would bring a profit to the farmer as considerable as it is easily calculated. When to this there is added the value of what they would gain in point of weight, the profit, it is hoped, will appear to be so great as to make the desire to grow turnips irresistible, and quickly to increase the quantity an hundred-fold beyond what it is at present.

Where the land is very dry the sheep may be penned upon a small part of the field of turnips, and shifted to another as those in the first part are eaten up; but if there is a field of grass near at hand, the superior improvement of the sheep will pay for the labour of carrying the turnips to be eaten on that field where they will lie dry and clean, and where the turnips will be less trampled on and abused.

Rotation of Crops.—It is the general opinion of farmers in Westmoreland, that their lands are better suited for grass than for bearing crops of corn, and they are ploughed for three or four years, not with an expectation that the corn will be more profitable than the grass, but in order to renovate them for grass, and to destroy the moss, which in a few years over-runs all their ley grounds: but there are some who are persuaded, that the neat profits of the three or four years the lands are under crop, usually exceed the profits of any other three or four years, while the same lands lie in grass, and they think that their fertility for the production of either grass or corn would be injured by ploughing for a longer term, or after shorter intervals of rest.

Whether the lands under the present system are most profitable to the farmer when they are in corn or in grass,

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it is not necessary now to enquire, because, with all due deference to the general practice and opinion of a whole county, it is presumed that a mode of husbandry and a succession of crops may be pointed out, which upon trial would be found far more profitable than those at present followed.

The uniting what may be called the Clover and the Turnip Husbandry is the best method hitherto discovered of keeping dry lands in a state of continual fertility, and for this the light and friable soil of the vallies of Westmoreland is well calculated. Instead of the common rotation of oats, barley, and oats again; and then leaving the land to grafs over of itself; the following course of crops might be introduced with advantage, both to the public and the individual. When an old close of good land is broken up it should be sown with oats, as is done at present; after the oats it should be manured and sown with turnips in drills thirty inches asunder, so as to admit of being horse-hoed; next with barley or oats, and always with grafs seeds at the rate of about sixteen pounds of clover, and a Winchester bushel of rye-grafs to the statute acre. If it is intended to pasture the field, the grafs seeds can hardly be sown too thick; if it is to be made into hay, the quantity of seeds above-mentioned will be found amply sufficient. The first year's crop of grafs may be mown twice, or after the first cutting it may be eaten by fattening cattle; or it may be eaten by sheep till the beginning of June, saved after that and mown in August, and it will still produce a valuable crop of foggage or after-math. It should be depastured with cattle or sheep the second year, and the third year likewise, if it shall be thought proper to keep the field so long in grafs.

This course would preserve the land in a state of perpetual *health and vigour*, did it not, taking pleasure in variety, dislike a too frequent repetition of the same crops.

After some rounds it will be proper to encrease the quantity of clover seed, and at last to bring it seldomer into succession, for if too often sown it will be rejected entirely. When this is apprehended the course may be varied or lengthened by the introduction of a crop of pease, or of drilled beans where the land is deep and moist, and wheat after either of these, or after a clean Summer-fallow, or by leaving the land some years longer in grass than usual.

When it shall be proved and known that potatoes are a cheap and nourishing food for horses, the demand for that valuable root will become nearly as unbounded as that for turnips is; and even although they exhaust the land, they may then be introduced into the course with much advantage to the farmer.

It is not pretended that the rotation of crops here recommended would suit all the arable lands of Westmoreland; but it is believed that, on a very large proportion of them, it might be followed with a certainty of success. The cold, wet, stiff soils should be Summer-fallowed instead of being cropped with turnips; wheat should be sown after the fallow, and clover, or oats, and then clover after the wheat; but it is impossible, and were it possible it would be improper, in a work of this general nature, to mention how all the varieties of soil should be treated; and to descend to the minutiae of ploughing and sowing, and ten thousand little matters that continually demand the farmer's attention, and that are always varying with the weather. In these his own ingenuity must assist him, and there all his ingenuity will be necessary; for his art, though apparently easy, is attended with a thousand difficulties.

SECT. 2.—*Wastes.*

There is room for great improvement in the management of sheep, as well upon private estates as upon the commons;

commons; but while these last continue in their present deplorable state, it would be in vain to attempt any alteration upon their flocks. The case, however, is different with store farms properly so called, where the breed or treatment of the sheep differs very little from that of those upon commons, although there can be no reasonable doubt of their being well adapted to the keeping a far more profitable sort than is to be found there at present. There is no weight whatever in the argument which has been often used against the introduction of such a breed from the scarcity of food and the coldness of the climate, the British Wool Society having proved that "the finest breeds of Spain or of England will thrive on the wildest of the Cheviot hills, and that very fine-woolled breeds may be propagated on the most mountainous districts of Scotland." There are numbers of sheep at the Feroe islands, which lie in latitude 63, and even in Iceland, part of which is beyond the Arctic circle; they are to be found in great abundance on every farm; and there Nature sports in a great superfluity of horns, as if the scanty pittance of food which the animal can pick up in that bleak and frozen climate were more than sufficient for the support of the carcase and the fleece.

The extensive and valuable commons of Westmoreland loudly demand the interposition of the legislature in a country that boasts of attention to its interest. Some immediate alteration in their state, whether by division or by sale, cannot be too eagerly pursued, nor too strongly inculcated; nor can it be too generally made known, that there are many wealthy people living near some of the best commons in the county, (which is a point of great importance) who do not think it worth while to avail themselves of their right of pasturage.

Every person sees the necessity of some material change with regard to the commons; and now that thinking men

are turning their attention to this important subject, there is no doubt that some plan will be fallen upon by which both the public and the individual may reap the full benefit of these, at present, dreary wastes, which are a reproach and disgrace to the nation. But it cannot be expected that any measure however wise, or any proposal however advantageous, can meet with universal approbation. It will probably be reprobated by some whose prejudices it will alarm, and with whose little interests it may be supposed to clash. Till something of greater consequence be accomplished, the reduction of the stint, where such is already established, or the establishment of a moderate stint upon commons that are perfectly free, ought not to be delayed one hour; for at present they are of little, if of any use, either to those having a right of commonage, or to the nation at large.

A general inclosure-bill for the whole kingdom would save the expence of separate applications to parliament for the division of particular commons, but there are many barren and rocky commons that would not be in any wise benefited by inclosure; and although the interests of a few individuals ought to give way to those of the community, there are numerous instances where both would be injured by the operation of such a bill; for it would at once be ruinous to many proprietors to be obliged to inclose each his share, often at an expence greater not only than the value of that share, but in some instances greater than the value of the fee-simple of that farm or estate in right of which he claims, and prejudicial to the public, by interrupting the sheep-walks upon the mountainous districts, which ought to be as free and open as possible.

The principal part of the stock kept upon the commons consists of sheep, either of the breed of the county, or brought from Scotland. The ewes are wintered in

the inclosures, and sent back to the commons in April; the wedder hoggrels are always wintered the first year on the low grounds at the expence of 2s. a head, are sent back to the commons about the same time with the ewes, and remain there till they are sold to the grazier. They may fetch at an average 11s. a piece; add to this the value of the wool, and 15s. may be about the sum received for every wedder sheep that arrives at the age of four years and a half.

Scotch hogs are bought at about 8s. 6d. a piece, and are kept two years upon the commons, when they may be worth 10s. 6d. or 11s.; add to this the price of three fleeces of wool, and the whole sum received for every sheep delivered may be about 14s.; from this subtract the original price, two years interest of the money, expence of herding for the first two months, of thrice washing and clipping, of twice salving, the value of the risk of bad payment from the drover or grazier, the loss by straying, and, what is often much more considerable, by death, and say what profit remains.

It has been computed that one third of all the sheep in Westmoreland died in 1792. Great calamities are often exaggerated, though no doubt the loss must have been prodigious when it was estimated so high.

Twenty shillings are reckoned an ordinary profit for keeping a Scotch beast a year; subtract from this the price of wintering on the low grounds and in the straw-yard, interest of the cost, value of the risk of drovers, loss by death from fatigue estimated at $2\frac{1}{2}$ per cent, by disease, and now and then by one tumbling into a peat-moss, and say what advantage arises from this adventure.

Seven shillings and sixpence are thought an ordinary profit for keeping a little Scotch beast on a common from May to October; make the same deductions as in the former

mer article, with the exception of the value of the Winter's keeping, and see how little remains for the rent of the land.

It is not possible to place this matter in a more striking point of view than by repeating, that on several commons the liberty of keeping an ox, or ten sheep, for a whole year, may be hired for *sixpence*.

Improvement of Wastes by Liming.—Great portions of many of these might be improved at a small expence by the application of lime, which is found in most parts of the county, and might be cultivated with the certainty of great advantage. When ploughed, great care ought to be taken to adopt a proper succession of crops, and to lay the lands down with grass seeds in a very few years; because, when exhausted by over-cropping, they are reduced to a worse state than they were in before, and there is no way yet discovered of preparing lands for a repetition of a hearty dose of lime.

By Paring and Burning.—Many of the level moory parts might be converted into arable lands by paring and burning, which are well understood by several persons in the county, and have been practised with more or less success on some private estates.

By Planting.—There are many thousands of acres utterly incapable of cultivation by the plough; and, in the paper prefixed, the Bishop of Landaff has shown, in a manner equally ingenious and novel, with what advantage these might be covered with wood. It is well known that trees flourish with the greatest vigour on soils far more barren, and in climates much colder, than that of Westmoreland. There are stately oaks at Niagara, which, though not in a high latitude, experience a degree of cold in Winter far beyond what is ever felt in this country. On the western coast of America, in latitude 61° , the very summits of the hills are covered with wood, and there

there is plenty of trees at Norton's Sound in latitude $64^{\circ} 55''$; and timber for the use of ships in the British navy has been cut even at Kamtschatka, the very end of the earth, where the soil is barren in the extreme, and covered with Summer snow, and where the Winters are rigorous beyond the conception of an inhabitant of Europe.

That Westmoreland has been a wooded county, is evident from trees found in mosses on the highest hills; and statutes and regulations made long after the Conquest, since which time the climate has not been changed for the worse, are full of the mention of forests, and chaces, and parks, and mastage, and pannage, and vert, and venison, and greenhue, and regards, and foresters, and verderors, and an hundred other names and titles respecting the preservation of the woods and the game.

The valuable plantations at Lowther-hall, the seat of the Earl of Lonsdale, show how well calculated the soil and climate of Westmoreland still are for the growth of timber, which, it cannot be questioned, would thrive over all the county as well now as it did five hundred years ago. The profits of planting are so distant, and so few persons, looking eighty or an hundred years beyond the present day, are willing to sacrifice a paltry interest for the sake of a remote posterity, that perhaps it may be necessary for Government to encourage by premiums what in the end would turn out so greatly to the advantage of the community. These might be distributed with much propriety by the Board of Agriculture, whose income seems to be far too moderate for the support of so important an establishment, the objects of whose superintendence are innumerable, and the field of whose operations is extensive as the island itself.

To the north of Shap lies a very extensive common called the Scars, where between two and three thousand
acres

acres of level white land, in a state of nature, offend the eye of every traveller, and cry aloud for improvement, the means of which it contains in immense quantities of limestone upon its very surface. It is more than twenty years since an act of parliament was obtained for a division of this common, and that it has not been carried into execution is the more to be regretted, as, in the opinion of very judicious persons in the neighbourhood, a large portion of it might be easily made as valuable as the little closes of Shap, which are let from 30s. to 40s. an acre.

On the south of Shap lies another common called the Fells, which is, in general, incapable of cultivation by the plough, but it is not ill suited to the maintenance of sheep; and the remains of the celebrated *Shap-thorn*, near the road to Orton, show that plantations would succeed even on those places of it which are most exposed.

Near the mouth of the river Kent there is a marsh of considerable extent, common to Haversham and Millthorpe, and, like all the other commons in Westmoreland, greatly overstocked. It would not be difficult to bank off the sea from this marsh, and to convert it into corn fields; but if this were thought not adviseable, its value might be instantly more than doubled by the establishment of a moderate stint, or still farther increased by a division.

Part of Crosby common might be easily converted into arable and good pasture land, and two clumps of trees, of a considerable size, prove that its worst parts might be planted with success.

From Crosby and Meaburn, a dry level common extends to within three miles of Appleby. It is covered with heath, and is capable of various modes of improvement.

The commons of Knock, Newbigging, Kirkby-Thore, and Marton, lie contiguous, and form a tract of several thousands of acres, dry, soft, and improveable. A great
part

part of these is covered with strong brackens, and is superior in quality to the soil of many farms in the neighbourhood, and well suited to the cultivation of turnips and clover.

This specimen of the commons in Westmoreland will, it is hoped, be deemed sufficient; for it would be tedious and painful to enumerate them all. It is difficult to behold the desolate state in which they lie, without surprise at the nation having so long delayed taking measures for their improvement. The wastes and commons in this county, and throughout England in general, have been elegantly called *a public treasure in the hands of private persons*; it is to be hoped that the time is not very distant when this important treasure shall be opened, and its contents shall prove equally beneficial to the individual, and to the public at large.

It is impossible to look forward without emotion to that day when these neglected wastes shall have received that degree of improvement of which they are susceptible; when they shall wave with valuable crops of corn, bleat with profitable flocks, or be clothed with stately timber; when every little rill shall be turned out of its natural course to fertilise the neighbouring plain; and when there may be seen in every corner the industrious husbandman, at once enriching himself and advantaging the community in a manner the most substantial!

Contemplating the matter in this view, who but must exclaim, what a noble field for exertion! What a source of national wealth yet in store! "More certain than the profits of commerce, more permanent than those of manufactures!"

Such are the reflections and observations that occurred in a Survey of the state of the stock and husbandry in the county of Westmoreland, made in the months of October and November 1793, at the request of the newly establish-

ed Board of Agriculture. What success has attended the attempt to place this important matter in a just light, others will judge; but it will be doing no more than justice to admit, that no pains have been spared in the execution of this task, which others might have performed with more ability, but not with greater alacrity or zeal.

It is impossible to conclude this Report without mentioning to the Board the very flattering manner in which the person commissioned by them to make this Survey, was received by all ranks and descriptions of persons in the county of Westmoreland. Every possible aid was given by the two respectable Members of the Board resident in the county. The other individuals who assisted him are too numerous to be discriminated; but the writer of this paper will ever remember their very polite attention with gratitude, and his short residence in that part of the kingdom with peculiar feelings of pleasure and respect.

What gratitude is due to HIM, who first called the attention of the nation to its most important interests, and whose unremitted efforts are directed to promote the good of his country! How well does He deserve, and what a sure road has He chosen to immortal fame, that will survive the ravages of time, and smile at the fleeting celebrity of martial achievements!

ADDENDA.

ADDENDA.



TO the note, page 68, the reader is desired to add,—The result of this experiment was, that, in the harvest of 1797, such parts of the wheat, the seed of which was pickled and limed, as well as that which was pickled and not limed, was nearly free from smut; but that which was neither pickled nor limed, had smutted ears in abundance, at least a hundred times more than the other: it may be proper to observe, the seed was purposely taken with a few balls of smut in it.—This experiment is decisively in favour of steeping in chamberlye.

The following addition is also desired to be made, (at the bottom of page 69,) to the paragraph on drilling, ending, “on moist soils.”—We have lately found it most convenient to yoke two horses to the drill, one going in each furrow, and to drill seven rows upon a ridge, of 80 to 84 inches wide, when the intervals are $10\frac{1}{2}$ or 11 inches; and 90 inches wide, when the intervals are 12 inches.

With the horses yoked in this manner in a five-row drill, ten rows may be sown upon ridges $10\frac{1}{2}$ feet wide, leaving a space on the top of the ridge, about 14 inches wide, for one of the horses to travel on; this is supposing the intervals 12 inches wide; but, if the intervals be $10\frac{1}{2}$ inches, then the ridges may be $9\frac{1}{2}$ feet wide.—A light harrow is fixed to the drill, to cover in the seed.

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The first part of the report was devoted to a general survey of the work done during the year. The second part dealt with the results of the various experiments conducted.

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It is a fact that the people of the world are not yet fully awake to the importance of the work of the Church. They are not yet fully awake to the fact that the Church is the only power that can bring about the redemption of the world. They are not yet fully awake to the fact that the Church is the only power that can bring about the redemption of the world. They are not yet fully awake to the fact that the Church is the only power that can bring about the redemption of the world.

DIRECTIONS TO THE BINDER.

—♦♦♦—	
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The Reader is desired to correct with his Pen the following

ERRATA.

Page 2, line 6, for country read county—p. 2, l. 8, for county read country—p. 5, l. 10, put a comma after seams—p. 19, l. 27, for warde read ward—p. 40, l. 36, for or read on—p. 41, l. 9, for CF read CE—p. 46, l. 26, for switches read switchers—p. 47, l. 7, for they are read they were—p. 81, l. 19, for country read county—p. 87, l. 5, for that read than—p. 91, l. 31, for into rich read into a rich—p. 94, l. 19, for gathered first read first gathered—p. 113, l. 8, erase the comma after fatten, place it after quicker—p. 119, l. 20, for scandix read scandix—p. 132, l. 21, for breed read breeds—p. 140, l. 5, for 15l. 10s. od. read 15l. 15s. od.—p. 151, l. 7, for one read and one—p. 162, l. 22, for have read and have—p. 164, l. 2, put a comma after fallow—p. 178, l. 24, for Chapter read Section—p. 180, l. 17, for or read and—p. 182, l. 17, for impropiator read impropiator—p. 203, l. 29, for val. p. acre read val. p. ann.—p. 208, l. 5, for seed read feed—p. 211 l. 13, for form as thick read forms a thick—p. 226, l. 23, for 1-2th read 1-12th—p. 252, l. 30, for tw read two—p. 258, l. 29, for would a yield read would yield.

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